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State Coal Profiles

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Preface

Section 205 (a)(2) of the Department of Energy Organization Act of 1977 (Public Law 95-91) requires the Administrator of the Energy Information Administration (EIA) to carry out a central, comprehensive, and unified energy data and information program that will collect, evaluate, assemble, analyze, and disseminate data and information relevant to energy resources, reserves, and related economic and statistical information.

As part of EIA's program to provide information on coal, this report, *State Coal Profiles*, summarizes basic information on the coal deposits, the development of

the coal industry, and the use of coal in each of the 27 States with coal production in 1992. This information should serve as the basis for more detailed analyses of the role an individual State's coal resources and coal industry have in contributing to the Nation's coal requirements.

The legislation that created EIA vested the organization with an element of statutory independence. EIA does not take positions on policy questions. EIA's responsibility is to provide timely, high-quality information and to perform objective, credible analyses.

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Introduction

The purpose of *State Coal Profiles* is to provide basic information about the deposits, production, and use of coal in each of the 27 States with coal production in 1992. Although considerable information on coal has been published on a national level, there is a lack of a uniform overview for the individual States. This report is intended to help fill that gap and also to serve as a framework for more detailed studies. While focusing on coal output, *State Coal Profiles* shows that the coal-producing States are major users of coal, together accounting for about three-fourths of total U.S. coal consumption in 1992.

At one time or another, coal has been produced in nearly all of the 38 States with coal deposits. Historically, this production played an important role in the development of these States as well as in the Nation's growth and westward expansion. U.S. coal production has reached record levels, but not all coal-producing States have shared in this growth. The peak years of coal production in some States occurred many decades ago, whereas in other States the coal industry has been revitalized in recent times. These changes reflect shifts in the use of coal over the years.

In the past, coal had a variety of uses. Large amounts were consumed for domestic heating, railroad fuel, as a source of heat for industrial processes, and as a source of coke for smelting iron ore for the iron and steel industry. Today, due to competition from other fuels and other sources of energy, coal is used mostly to generate electricity. Concern over environmental quality and the enactment of clean air legislation has led to the greater use of low-sulfur coal. This adversely affected production in States with low-quality coal, but rejuvenated the coal industry in States with environmentally acceptable coal. Advances in the technology

for burning coal cleanly and for using it in new ways, such as a source of chemicals, could create future opportunities for coal development in some States.¹

Each coal-producing State is profiled with a description of its coal deposits and a discussion of the development of its coal industry. Estimates of coal reserves in 1992 are categorized by mining method and sulfur content. Trends, patterns, and other information concerning production, number of mines, miners, productivity, mine price of coal, disposition, and consumption of coal are detailed in statistical tables for selected years from 1980 through 1992. In addition, coal's contribution to the State's estimated total energy consumption is given for 1991, the latest year for which data are available. A U.S. summary of all data is provided for comparing individual States with the Nation as a whole. Sources of information are given at the end of the tables.

Also included are a graph showing annual coal production in each State from 1890 through 1992 and three maps. The first map shows the coal-producing counties in 1992, the approximate locations of coal-fired power plants, coke plants, and coal gasification plants that were active during the year, and the approximate extent of coal-bearing areas. The other maps show, for 1992, the domestic distribution of coal produced in each State and the domestic origin of the coal shipped to each coal-producing State.

The appendices contain: (1) a table showing the 1992 national rankings of the coal-producing States for several categories of coal data, and (2) a list of addresses and telephone numbers of State agencies and other sources that can provide additional information about coal and current developments in each coal-producing State.

¹The methane in coalbeds is produced commercially as an energy source in several States (e.g., Alabama, New Mexico, and Wyoming). Coalbed methane has become an important part of the U.S. reserves and production of natural gas, which is predominantly methane. A review of coalbed methane is beyond the scope of this report. For information, see “Coalbed Methane—State of the Industry,” *Quarterly Review of Methane from Coal Seams Technology* 11, 1 (August 1993), pp. 1-52; Energy Information Administration, “Update on U.S. Coalbed Methane Production,” *Natural Gas Monthly October 1990*, DOE/EIA-0130(90/10) (Washington, DC, December 1990), pp.1-15; and “U.S. Coalbed Methane Production,” *Natural Gas Monthly January 1994*, DOE/EIA-0130(94/01) (Washington, DC, January 1994), pp. 1-11.

State Coal Profile: Alabama

Coal is the most important mineral commodity produced in Alabama, based on value of production. In 1992, the State's output of coal represented nearly one-half of the total estimated value of all mineral commodities produced in the State, including crude oil and natural gas. Production from Federal coal leases generated nearly \$1 million in royalties, which were disbursed equally to the State and Federal Governments.

Large bituminous coal deposits occur in the northwestern part of the State. Lignite deposits, which are not mined, are scattered in the coastal plain in the South. The Warrior coalfield is the largest and most productive area. About 20 coalbeds are mined in the State, but most production is from the Blue Creek and Mary Lee coalbeds in the Warrior coalfield. These beds average 6 to 7 feet in thickness. Much of Alabama's coal can be converted into coke to make steel.

Commercial coal production in Alabama began around 1832 and was probably from outcrops in the Black Warrior River in Tuscaloosa County. The coal was transported by barge to Mobile and sold in competition with coal imported from England. The State's first large-scale underground mine, the Montevallo, was opened in Shelby County in 1856.

By about 1870, the development of the iron and steel industry in Birmingham provided the opportunity to mine large deposits of coking coal in the area. To satisfy the demand for coal for this and other domestic markets, including the railroads, Alabama's coal output rose from 8 million short tons at the turn of the century to 21 million short tons in 1926 before falling to less than half that amount during the Depression. Production during World War II increased to 19 million short tons.

Postwar production decreased as the pattern of coal use changed due to the dieselization of the railroads, competition from other fuels in the domestic market, and declining overseas markets. Production fell to about 10 million short tons in 1954 before beginning a generally upward trend. Initially supported by demand

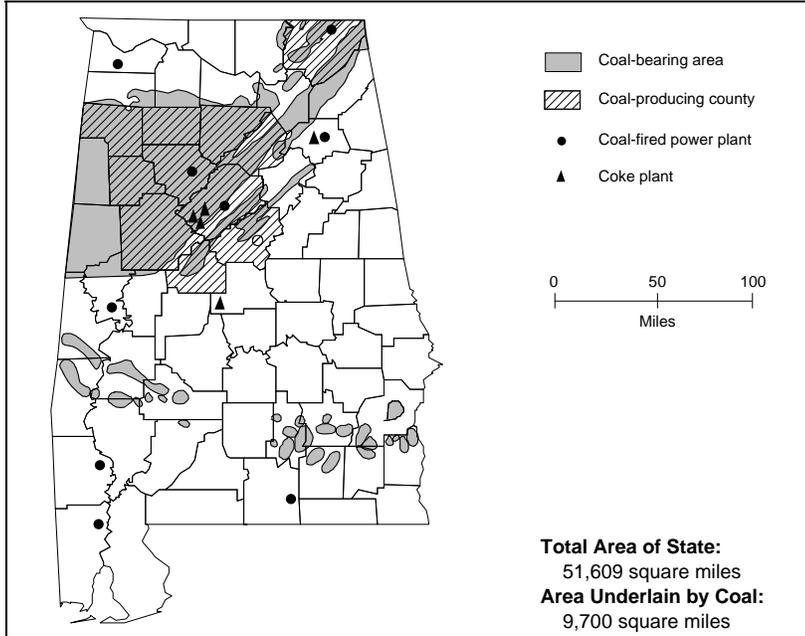
from the iron and steel industry, production is now largely sustained by the increased use of coal to generate electricity. Alabama's coal production was 26 million short tons in 1992.

Underground mines have generally been the major sources of Alabama's coal production. Several of these mines are among the deepest in the United States, producing from about 2,000 feet. In 1992, the State's largest coal producer, with more than 2 million short tons, was the Blue Creek No. 4 underground mine of Jim Walter Resources, Inc., in Tuscaloosa County. Tuscaloosa, Walker, and Jefferson were the leading coal-producing counties. About 1 percent of Alabama's 1992 coal output was from Federal coal leases.

In 1992, about three-fourths of Alabama's coal production was distributed to domestic markets and nearly one-fourth was exported overseas. More than 90 percent of the coal produced for domestic use was consumed in Alabama. The State's coal consumption was 32 million short tons in 1992. Electric utilities have been Alabama's leading coal consumers since the 1960's, and their share of total consumption has grown steadily. More than two-thirds of the utility coal received in 1992 was produced in the State, with most of the balance received from Kentucky. The largest coal-fired generating facility is the 2,690-megawatt James H. Miller, Jr., plant of Alabama Electric Power Company in Jefferson County. About half of the coking coal used in Alabama was produced in the State; West Virginia and Virginia supplied virtually all of the balance. More than half of the coal delivered to other industrial users was Alabama coal. The principal consumers in this sector were paper and pulp mills, cement and lime plants, and organic fiber manufacturers.

The Customs District of Mobile ranked fifth in the United States in coal exports in 1992, handling 7 million short tons, or 7 percent, of the U.S. total. Mobile is a shipping point for export coal produced in Alabama and other coal-producing States in the East. The coal-loading terminals are the McDuffie Island Terminal and the Bulk Plant, both operated by Alabama State Docks Department.

Alabama



Coal Production, 1890-1992



First Year of Documented Coal
 Production 1840 (946 short tons)
Peak Year of Coal
 Production 1990 (29,030,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base:			
(January 1, 1992)	1,454	3,308	4,762
Estimated Recoverable Reserves:			
(January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	169	259	428
0.61-1.67 (medium sulfur)	503	1,958	2,461
> 1.67 (high sulfur)	61	139	200
Total	733	2,356	3,089
Estimated Recoverable Reserves			
at Active Mines, Year-End 1992	379	89	468

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	9,504	14,440	17,540	17,070	15,944
Mines	18	20	12	13	13
Miners	7,160	5,832	4,395	4,473	3,810
Productivity (short tons per miner per hour) .....	.71	1.34	2.01	1.90	2.17
Average Mine Price (dollars per short ton)	43.37	44.22	42.48	40.19	40.70
Surface					
Quantity (thousand short tons)	16,899	13,357	11,490	10,199	9,852
Mines	158	111	85	83	75
Miners	4,528	2,784	2,139	1,841	1,576
Productivity (short tons per miner per hour)	2.40	2.40	2.69	2.84	3.28
Average Mine Price (dollars per short ton)	33.56	41.35	43.90	42.72	41.02

Total

Alabama

Quantity (thousand short tons)	26,403	27,797	29,030	27,269	25,796
Mines	176	131	97	96	88
Miners	11,688	8,616	6,534	6,314	5,386
Productivity (short tons per miner per hour)	1.31	1.70	2.23	2.17	2.49
Average Mine Price (dollars per short ton)	37.01	42.84	43.04	41.14	40.82

Alabama

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	8	94	1	5	0	0	4	1
Surface	0	0	5	43	22	42	48	15
All Mines	8	58	6	19	22	16	52	7

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	19,593	21,545	22,010	23,700	24,988
Coke Plants	4,849	2,883	3,288	3,166	3,297
Other Industrial	2,202	2,541	2,237	2,468	3,139
Residential and Commercial	209	99	105	17	89
Total	26,853	27,069	27,640	29,349	31,513
Year-End Utility Stocks (thousand short tons)					
	5,734	4,324	3,869	4,247	4,071
Electricity Generation					
Total (million kilowatthours)	78,292	72,667	76,232	85,051	90,792
Coal (percent)	58	71	70	68	67
Nuclear (percent)	30	20	16	19	21
Other (percent)	12	9	14	13	12

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	24.19	24.12
Sulfur Content (percent by weight)	1.26	1.43
Ash Content (percent by weight)	12.42	11.80
Pounds of Sulfur per million Btu	1.04	1.19
Dollars per million Btu	1.96	1.73
Dollars per short ton	47.35	41.67

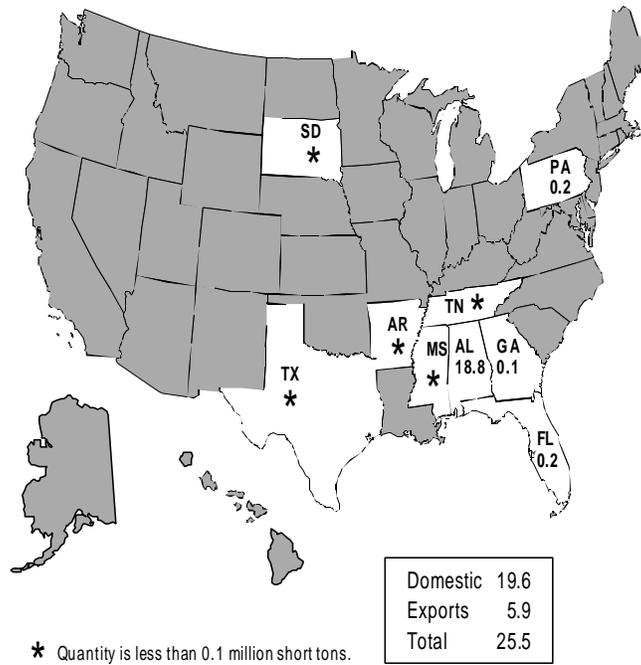
Alabama

Estimated Total State Energy Consumption, 1991: 1,591 trillion Btu (coal, 720; natural gas, 261; petroleum, 526; nuclear electric power, 171; hydroelectric power, 112; other, 0; net interstate flow of electricity and associated losses, -198).

Notes: Totals may not equal sum of components because of independent rounding. Data coverage—**Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

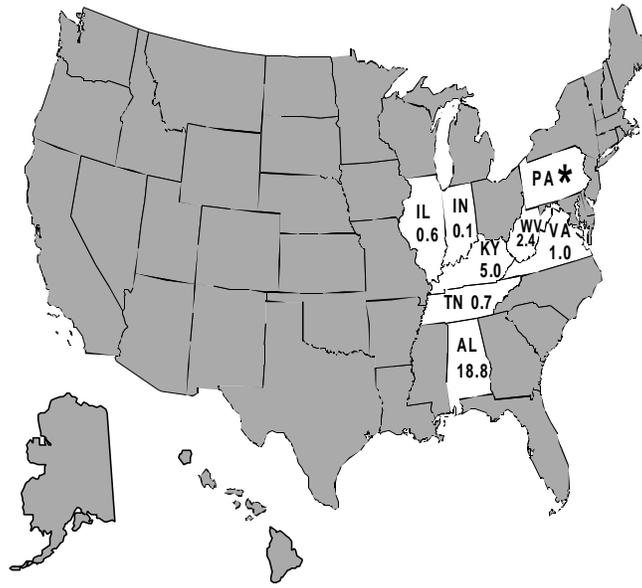
Destination of Coal Produced in Alabama, 1992
(Million Short Tons)



Transportation modes to domestic markets (percent): rail, 33; water, 12; truck, 45; tramway/conveyor, 9; unknown 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Alabama, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	28.7
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Alaska

Alaska has an extensive reserve base of coal, but very little of it has been developed because of competition from the petroleum and natural gas produced in the State. Currently, only one surface mine actively produces coal in the State, and about half of its annual output of 1.5 million short tons is exported.¹ The value of coal production to the economy of Alaska is also small. In 1992, coal was estimated to account for less than 1 percent of the total value of all mineral commodities produced in the State, including crude oil and natural gas.

Coal mining in Alaska began on a commercial scale in 1855, while the area was still a Russian territory. A mine was developed near Port Graham, on the Kenai Peninsula, with the hope of exporting coal to California. Unable to compete in the export market, the mine instead supplied coal to steamers, whaling ships, and local consumers for about 10 years. After Alaska was purchased by the United States, in 1867, many small mines were opened to provide coal for riverboats, domestic heating, and thawing frozen ground for gold mining. Production at the turn of the century was about 3,000 short tons per year. This represented about 3 percent of the total coal consumed in Alaska. Canada and Washington State supplied most of the rest.

In the early 1900's, coal production trended upward as mines were opened near Anchorage and Healy to supply coal for the U.S. Navy, for developments at Anchorage and Fairbanks, and for the Alaska Railroad. In addition to consuming coal, the Alaska Railroad played an important role in opening up coal markets along its route.

Production rose from about 100,000 short tons in the late 1920's to more than 700,000 short tons in the 1950's. During and after World War II, the military buildup near Anchorage and Fairbanks expanded markets for coal. In the postwar period, markets were lost and

mines closed when the Alaska Railroad converted to diesel-electric locomotives, and when oil and natural gas produced from large deposits discovered in the Cook Inlet captured most of the coal market in the Anchorage area. Afterward, coal production fluctuated from 600,000 to 900,000 short tons until 1985, when it rose sharply to 1.4 million short tons with the beginning of exports to Korea.

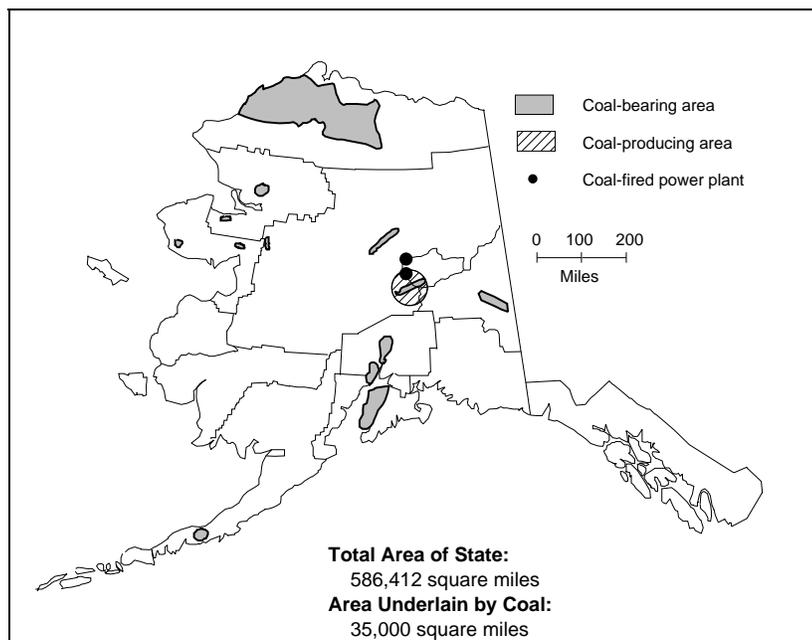
Since the early 1970's, the only active coal mine in Alaska has been operated by Usibelli Coal Mine, Inc., near Healy in the Nenana field, south of Fairbanks. Several other coal mines are planned in Alaska, pending an expansion of Alaska coal exports to the Asian market.

The Usibelli mine produces subbituminous coal mainly from three beds that range from 18 to nearly 30 feet in thickness. Overburden is removed by a dragline that reportedly is the largest land-based machine in Alaska. Coal is transported from the mine by the Alaska Railroad. As mined, Usibelli coal averages 15.6 million Btu per short ton, 0.2 percent sulfur (by weight), and 8.1 percent ash.

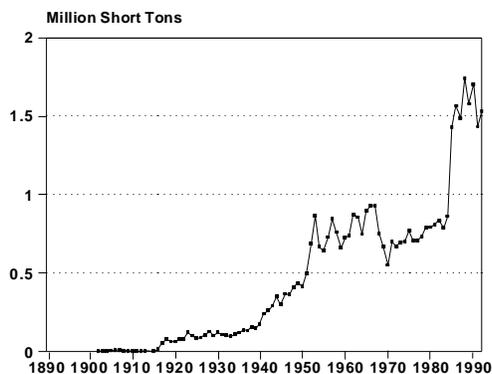
Usibelli's domestic customers include a minemouth power plant at Healy, and cogeneration power plants, which supply both electricity and steam for heating, that are operated by the Fairbanks Municipal Utilities System, the University of Alaska Fairbanks, and military bases near Fairbanks. The State's largest coal-fired electric generating facilities are the 28-megawatt Chena plant, operated by the City of Fairbanks, and the 27-megawatt Healy plant, operated by Golden Valley Electric Association. Small amounts of coal are also used for heating residences and schools in the Healy and Fairbanks areas. Usibelli exports coal to the Korean Electric Power Company. The export coal is transported on the Alaska Railroad about 300 miles to Seward, a year-round ice-free port.

¹In 1992, Arctic Slope Consulting Group was developing a coal mine in the Deadfall Syncline area, near Kotzebue; production was less than 1,000 short tons.

Alaska



Coal Production, 1890-1992



First Year of Documented Coal
Production 1897 (2,000 short tons)
Peak Year of Coal
Production 1988 (1,745,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	5,423	713	6,136
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	2,120	432	2,552
0.61-1.67 (medium sulfur)	0	0	0
> 1.67 (high sulfur)	0	0	0
Total	2,120	432	2,552
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	791	1,433	1,706	1,436	1,534
Mines	1	1	1	1	2 ^a
Miners	33	96	84	99	111
Productivity (short tons per miner per hour)	6.12	6.20	8.46	6.82	6.93
Average Mine Price (dollars per short ton)	W	W	W	W	W

Total

Alaska

Quantity (thousand short tons)	791	1,433	1,706	1,436	1,534
Mines	1	1	1	1	2
Miners	33	96	84	99	111
Productivity (short tons per miner per hour)	6.12	6.20	8.46	6.82	6.93
Average Mine Price (dollars per short ton)	W	W	W	W	W

Alaska

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	1	100	0	0	0	0	1	<1
All Mines	1	100	0	0	0	0	1	<1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	272	296	290	298	267
Coke Plants	0	0	0	0	0
Other Industrial	0	W	0	0	0
Residential and Commercial	0	W	494	504	514
Total	272	733	784	802	782
Year-End Utility Stocks (thousand short tons)					
	5	2	2	8	6
Electricity Generation					
Total (million kilowatthours)	3,090	4,285	4,493	4,286	4,129
Coal (percent)	10	7	7	8	7
Nuclear (percent)	0	0	0	0	0
Other (percent)	90	93	93	92	93

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	--	--
Sulfur Content (percent by weight)	--	--
Ash Content (percent by weight)	--	--
Pounds of Sulfur per million Btu	--	--
Dollars per million Btu	--	--
Dollars per short ton	--	--

Alaska

Estimated Total State Energy Consumption, 1991: 588 trillion Btu (coal, 13; natural gas, 368; petroleum, 198; nuclear electric power, 0; hydroelectric power, 9; other, 0; net interstate flow of electricity and associated losses, 0).

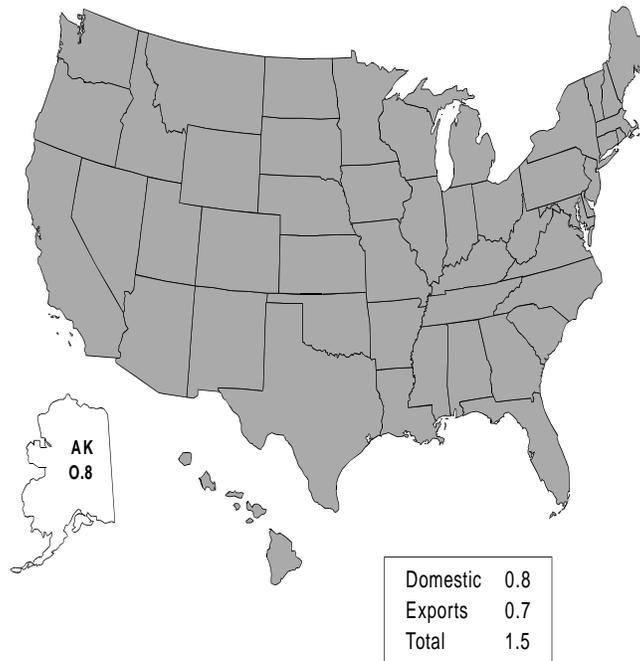
^aIncludes one mine under development with a small output during part of the year.

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference; Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Alaska, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 81; truck, 19.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Alaska, 1992
(Million Short Tons)



Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Arizona

Coal ranks a distant second in value to copper among the mineral commodities produced in Arizona. However, Arizona is notable as a source of coal because all production is from leases on Indian lands, and because the State has the only long-distance coal-slurry pipeline in the country. Indian royalties from coal sales in 1992 were \$33 million.

All of Arizona's coal production, which totaled about 13 million short tons in 1992, is from the Black Mesa field in the northeastern part of the State, in Navajo County. This is a plateau area covering more than 3,000 square miles of Indian land. Black Mesa coal is generally classified as bituminous coal.

Black Mesa coal is historically noteworthy because archeological evidence shows that prehistoric Indians used it for firing pottery at least as far back as 1300 A.D. Although the first official record of coal production in Arizona was in 1926, small amounts of coal were mined by settlers for local use in earlier years. Between 1926 and 1970, coal production was intermittent and usually amounted to less than 10,000 short tons per year, reflecting the remoteness of the coal deposits, a small population, and a lack of coal-based industries. Most of the coal was produced for heating schools on the Navajo Indian Reservation.

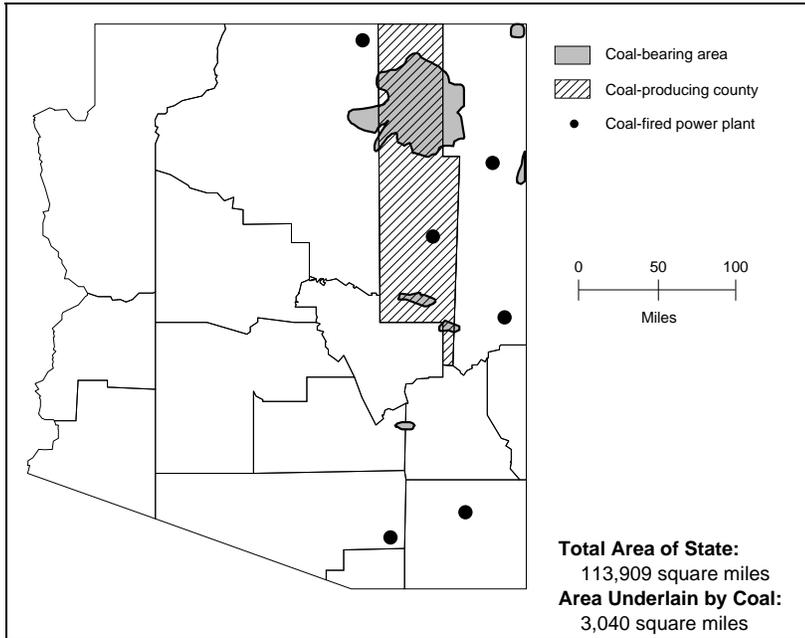
After 1970 the output of coal in Arizona increased markedly. This was due to the opening of two large surface mines in Black Mesa field—Black Mesa and Kayenta—to produce coal for two large power plants built

to help meet the growing demand for electricity in southern California and the Southwest. Peabody Coal Company developed and continues to operate both mines, located about 16 miles apart, on about 65,000 acres of land leased from the Navajo and Hopi Indian tribes. Production is from four to five coalbeds that range from 3 to 10 feet in thickness. Both mines rank among the largest U.S. coal mines.

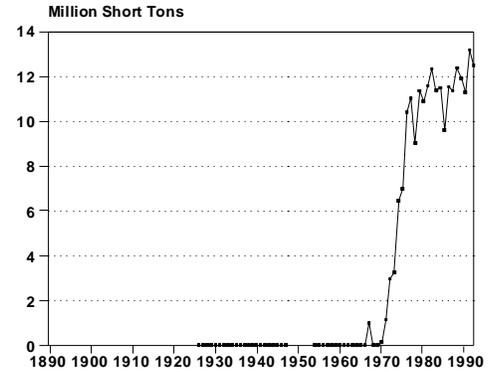
Black Mesa supplies coal to the 1,580-megawatt Mohave power plant of Southern California Edison Company, in southeastern Nevada. The transportation link between the mine and power plant is unique: coal is delivered as a slurry through a 273-mile long, 18-inch pipeline. The coal slurry (a mixture of half finely ground coal and half water, by weight) is pumped at a rate of about 3.5 miles per hour. Kayenta produces coal for the 2,250-megawatt Navajo power plant, located near Page, in Coconino County, and operated by the Salt River Project Agricultural Improvement and Power District. Coal from the mine is hauled to the power plant on an 83-mile-long private railroad. A 17-mile long conveyor connects the mine with the railroad.

Less than half of the 18 million short tons of coal consumed in Arizona in 1992 was produced in the State. Electric utilities were the principal consumers. Except for the Navajo power plant, the utilities consumed coal received primarily from New Mexico. Other coal consumers in Arizona were chiefly cement plants and a paperboard mill.

Arizona



Coal Production, 1890-1992



First Year of Documented Coal Production 1926 (624 short tons)
Peak Year of Coal Production 1991 (13,203,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	102	135	236
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	51	106	158
0.61-1.67 (medium sulfur)	0	0	0
> 1.67 (high sulfur)	0	0	0
Total	51	106	158
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	10,905	9,625	11,304	13,203	12,512
Mines	2	2	2	2	2
Miners	897	885	951	900	888
Productivity (short tons per miner per hour)	5.29	6.53	5.93	6.64	6.29
Average Mine Price (dollars per short ton)	W	W	W	W	W

Total

Arizona

Quantity (thousand short tons)	10,905	9,625	11,304	13,203	12,512
Mines	2	2	2	2	2
Miners	897	885	951	900	888
Productivity (short tons per miner per hour)	5.29	6.53	5.93	6.64	6.29
Average Mine Price (dollars per short ton)	W	W	W	W	W

Arizona

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	2	100	0	0	0	0	0	0
All Mines	2	100	0	0	0	0	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	10,915	14,448	15,758	16,116	17,227
Coke Plants	0	0	0	0	0
Other Industrial	W	W	660	689	632
Residential and Commercial	W	W	0	0	4
Total	11,558	16,364	16,419	16,805	17,862
Year-End Utility Stocks					
(thousand short tons)	5,541	3,163	3,090	4,177	3,543
Electricity Generation					
Total (million kilowatthours)	36,876	48,227	62,289	66,767	70,109
Coal (percent)	59	60	51	48	49
Nuclear (percent)	0	2	33	38	37
Other (percent)	41	38	16	14	14

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	22.00	20.61
Sulfur Content (percent by weight) .....	.52	.51
Ash Content (percent by weight)	9.50	12.19
Pounds of Sulfur per million Btu .....	.47	.50
Dollars per million Btu	1.10	1.37
Dollars per short ton	24.28	28.31

Arizona

Estimated Total State Energy Consumption, 1991: 924 trillion Btu (coal, 348; natural gas, 128; petroleum, 353; nuclear electric power, 270; hydroelectric power, 75; other, 0; net interstate flow of electricity and associated losses, -250).

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

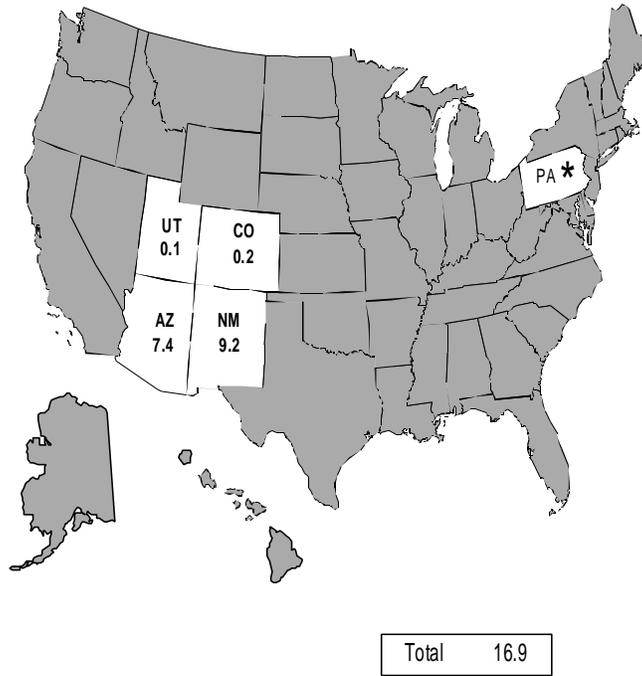
Destination of Coal Produced in Arizona, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 60; tramway/conveyor/slurry pipeline, 40.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Arizona, 1992
(Million Short Tons)



Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Arkansas

As a source of coal, Arkansas is relatively insignificant. Its 1992 output of 58,000 short tons was the smallest of all States. The value of the coal was less than 1 percent of the estimated value of all mineral commodities produced in the State.

The Arkansas coal deposits consist mostly of bituminous coal and semianthracite in the western Arkansas Valley. The area, an eastern extension of the Oklahoma coal-bearing region, is about 30 miles wide and 90 miles long. The geologic formations in the Arkansas Valley have been considerably folded and faulted, and the coalbeds often thin out. These features have contributed to the cost of mining in the area. Lignite occurs in the coastal plain in the southern and northeastern parts of the State. Currently, only bituminous coal is mined in Arkansas. The Lower Hartshorne coalbed, which averages about 2 feet in thickness, is the most productive and extensive coalbed in the State. It has a heat value averaging 26 million Btu per short ton (as-received basis) and a sulfur content averaging between 1 and 2 percent (by weight).

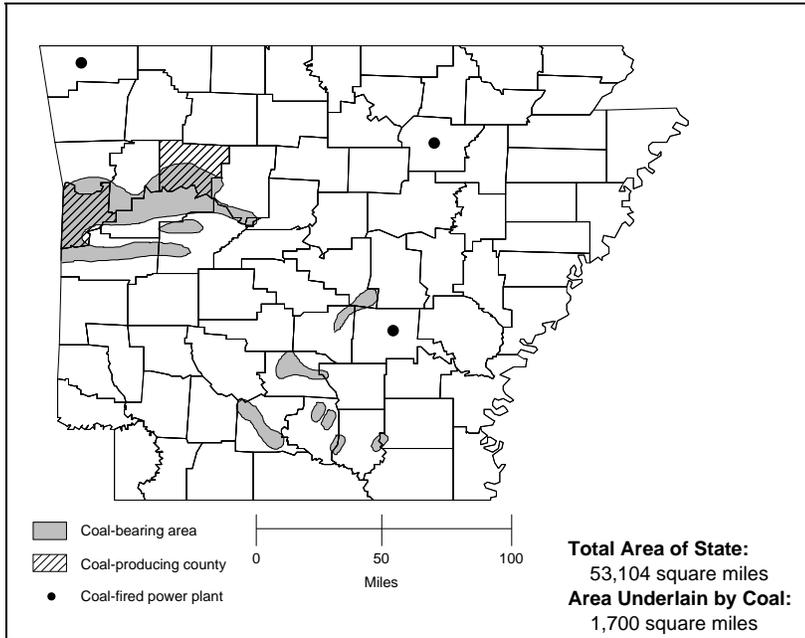
Coal was first mined in Arkansas around 1840, but production did not become economically important until about 1870, after railroads expanded into the Arkansas Valley. Although the output was chiefly bituminous coal, small amounts of lignite were also produced for use as boiler fuel, local heating, and a source of distilled oil. After reaching a peak of nearly 3 million short tons in 1907, production declined due to competition from other fuels, including oil and natural gas discovered in the State. It rose slightly during

World War II, but afterwards fell sharply to an annual average of less than 100,000 short tons. Virtually all production has been bituminous coal, including some used in the past for making metallurgical coke, and some semianthracite. A small amount of lignite was mined in the late 1930's and early 1940's to produce Van Dyke brown dye and montan wax, a fossil plant wax used for industrial purposes. In 1988, a small amount of lignite was used for test-burning as a blend with western coal in a local power plant.

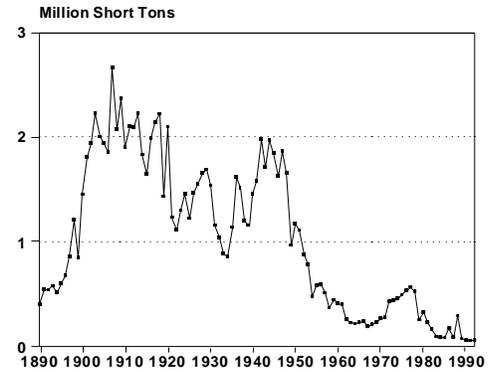
Underground mines accounted for the bulk of the early coal production in Arkansas, but surface mines have predominated since 1958. Coal was last mined underground in Arkansas in 1978. Production in 1992 was from Johnson and Sebastian counties. The State's largest coal producer was the Wilken No. 1 surface mine of Mid-America Mining and Development Company, in Sebastian County.

In 1992, about half of the coal produced was shipped out of the State. Virtually all of the 13 million short tons of coal consumed in Arkansas in 1992 was used to generate electricity. All of the utility coal was subbituminous coal from Wyoming. This was consumed at two power plants with nearly equal coal-fired electricity generating capabilities, both operated by Arkansas Power and Light Company: the 1,678-megawatt Independence plant, in Independence County, and the 1,659-megawatt White Bluff plant, in Jefferson County. A small amount of coal was consumed for other industrial use, mainly at a paper mill and a cement plant.

Arkansas



Coal Production, 1890-1992



First Year of Documented Coal Production 1840 (220 short tons)
Peak Year of Coal Production 1907 (2,670,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	273	145	417
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	7	2	8
0.61-1.67 (medium sulfur)	110	97	207
> 1.67 (high sulfur)	10	3	13
Total	127	101	228
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	319	80	59	52	58
Mines	4	7	7	7	6
Miners	75	26	13	14	14
Productivity (short tons per miner per hour)	1.21	1.80	1.46	2.27	1.68
Average Mine Price (dollars per short ton)	41.83	W	W	W	W

Total

Arkansas

Quantity (thousand short tons)	319	80	59	52	58
Mines	4	7	7	7	6
Miners	75	26	13	14	14
Productivity (short tons per miner per hour)	1.21	1.80	1.46	2.27	1.68
Average Mine Price (dollars per short ton)	41.83	W	W	W	W

Arkansas

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	0	0	0	0	0	0	6	100
All Mines	0	0	0	0	0	0	6	100

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	1,774	12,302	11,836	11,978	12,325
Coke Plants	0	0	0	0	0
Other Industrial	296	379	256	283	295
Residential and Commercial	6	1	0	0	2
Total	2,076	12,682	12,092	12,261	12,622
Year-End Utility Stocks					
(thousand short tons)	1,964	2,513	1,722	2,150	1,572
Electricity Generation					
Total (million kilowatthours)	19,685	35,565	37,053	38,365	37,507
Coal (percent)	15	57	52	51	54
Nuclear (percent)	40	28	30	33	30
Other (percent)	45	15	18	16	16

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	--	17.45
Sulfur Content (percent by weight)	--	.32
Ash Content (percent by weight)	--	5.12
Pounds of Sulfur per million Btu	--	.37
Dollars per million Btu	--	1.65
Dollars per short ton	--	28.84

Arkansas

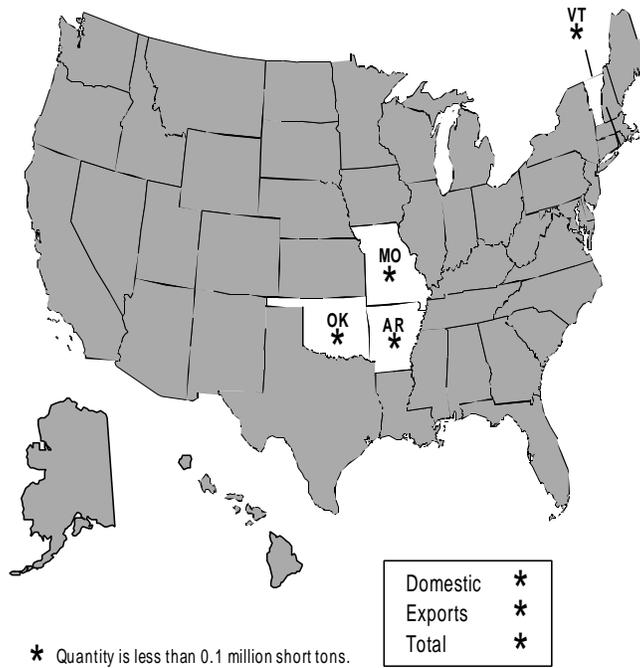
Estimated Total State Energy Consumption, 1991: 770 trillion Btu (coal, 216; natural gas, 213; petroleum, 271; nuclear electric power, 136; hydroelectric power, 37; other, 0; net interstate flow of electricity and associated losses, -103).

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates* Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

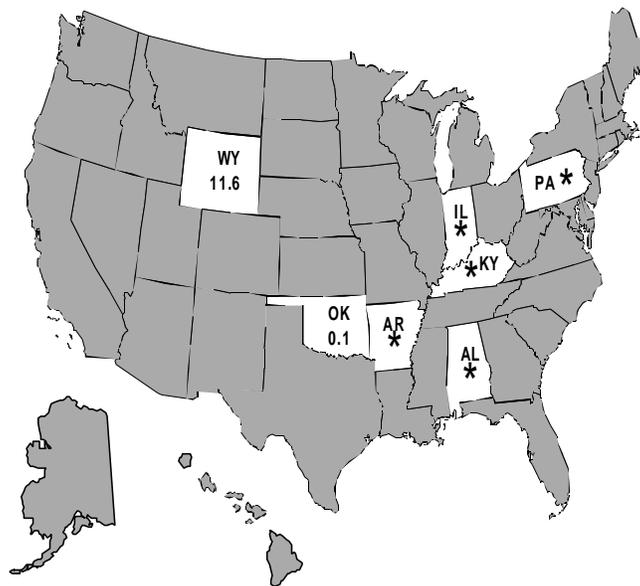
Destination of Coal Produced in Arkansas, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): truck, 100.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Arkansas, 1992
(Million Short Tons)



Note: Total may not equal sum of components because of independent rounding. Total 11.8
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: California

Coal occurs in California in small, widely scattered deposits that range in rank from lignite to bituminous. A small amount of lignite is surface mined as a source of montan wax by Jackson Valley Energy Partners, L. P., near Ione, Amador County. The operation is unique because it is the only U.S. coal deposit mined for montan wax, a fossil plant wax (found in only a few American lignites) used for industrial purposes.

Coal was mined in California as early as 1855, but coal mining as an industry began in 1861. Much of the early production was from Contra Costa County. Coal was used as fuel for railroads, steamboats, flour mills, manufacturing plants, and domestic heating. Total output reached a peak of 237,000 short tons in 1880, about the time when large deposits of oil and natural gas were discovered in the State. After 1900, production dropped sharply and became practically insignificant as oil and gas displaced coal as a source of energy in the State.

At the end of World War II, California's lignite deposits were among those investigated as part of a Federal program to locate domestic deposits with a high wax content. The search was prompted by a wartime shortage of montan wax, which had been imported chiefly from Germany. The lignite deposit near Ione was one of the few found to have a wax content of economic potential. In 1947, the deposit, mined initially to produce lignite briquettes, was developed as a source of montan wax.

The Ione lignite bed, 12 to 15 feet thick, is surface mined selectively after drilling has located areas with a high wax content. It is mined during the driest summer months and stockpiled at the wax plant for use throughout the year. The level of production is governed by the market for montan wax. Production in 1992 was 103,000 short tons. Montan wax is extracted

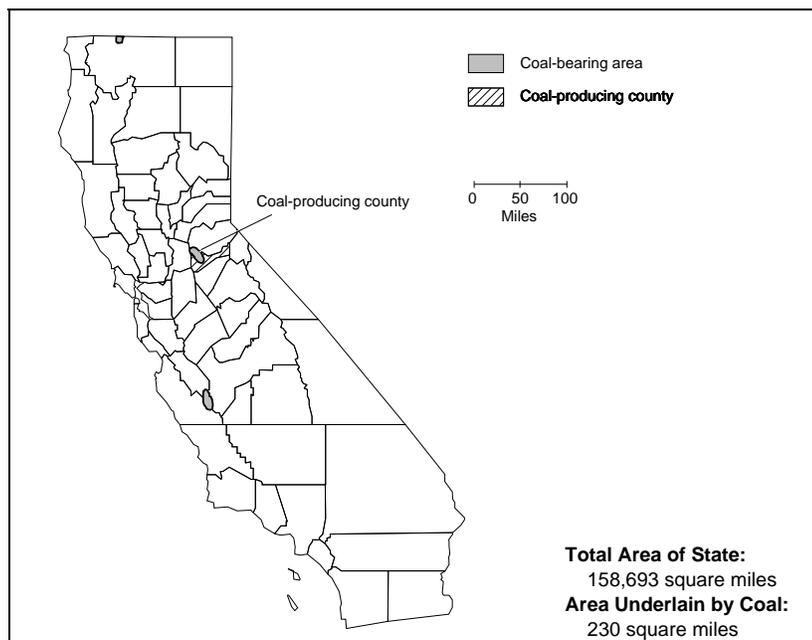
from dried, pulverized lignite through the use of solvents. The wax is hard and brittle and has a high melting point; its properties are similar to those of natural plant waxes, such as carnauba, which it can replace. Most of the wax undergoes additional processing to produce waxes for specific uses. The principal use is in hot-melt carbon inks. Other applications include spray lubricants, thin-film temporary coatings, release agents for molded phenolic parts and polyurethane fiber board, protective coatings, special waterproofing compounds, and ink additives.

Lignite residue from wax production is used as fuel in an adjacent 15-megawatt fluidized-bed cogeneration plant that began commercial operation in 1987. The lignite residue has a heat content of about 10 million Btu per short ton. Steam, hot air, and some of the electricity produced at the facility are sold to the wax plant. Most of the electricity produced is sold to Pacific Gas and Electric Company. A small amount of lignite residue is also sold as a soil conditioner.

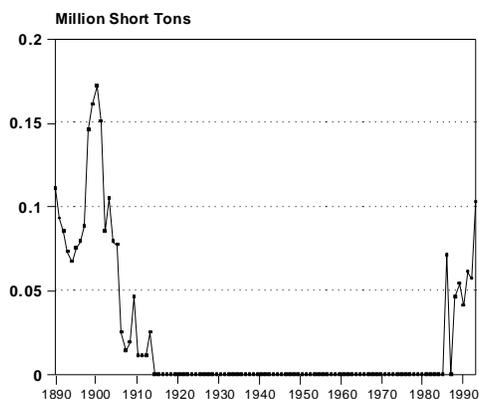
Although wax production represents the most unusual use of coal in California, considerably more coal is used as a fuel. Most of the 3 million short tons of coal consumed in 1992 was produced in Utah. Cement plants were the major coal consumers, accounting for more than half of the State's total. More than one-third was used as a source of heat for producing sodium carbonate from natural brines. Until 1983, coal from Utah and New Mexico was converted into coke at Fontana and used to manufacture steel. No coal is used in the State's power plants.

Several ports in California are shipping points for coal exports from western mines. Los Angeles is by far the principal coal-exporting district, accounting for most of the 3 million short tons of coal exported through California in 1992.

California



Coal Production, 1890-1992



First Year of Documented Coal Production 1861 (6,620 short tons)
Peak Year of Coal Production 1880 (237,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	NA	NA	NA
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	NA	NA	NA
0.61-1.67 (medium sulfur)	NA	NA	NA
> 1.67 (high sulfur)	NA	NA	NA
Total	NA	NA	NA
Estimated Recoverable Reserves at Active Mines, Year-End 1992	NA	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	0	71	61	57	103
Mines	0	1	1	1	1
Miners	0	9	5	8	8
Productivity (short tons per miner per hour)	--	4.23	17.69	11.31	11.12
Average Mine Price (dollars per short ton)	--	W	W	W	W

Total

California

Quantity (thousand short tons)	0	71	61	57	103
Mines	0	1	1	1	1
Miners	0	9	5	8	8
Productivity (short tons per miner per hour)	--	4.23	17.69	11.31	11.12
Average Mine Price (dollars per short ton)	--	W	W	W	W

California

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	0	0	0	0	1	100	0	0
All Mines	0	0	0	0	1	100	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	0	0	0	0	0
Coke Plants	1,510	0	0	0	0
Other Industrial	1,155	1,889	2,874	2,771	2,821
Residential and Commercial	4	53	25	44	0
Total	2,669	1,942	2,899	2,816	2,821
Year-End Utility Stocks (thousand short tons)					
	0	0	0	0	0
Electricity Generation					
Total (million kilowatthours)	140,341	127,846	114,528	104,968	119,308
Coal (percent)	0	0	0	0	0
Nuclear (percent)	4	15	29	30	30
Other (percent)	96	85	71	70	70

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	--	--
Sulfur Content (percent by weight)	--	--
Ash Content (percent by weight)	--	--
Pounds of Sulfur per million Btu	--	--
Dollars per million Btu	--	--
Dollars per short ton	--	--

California

Estimated Total State Energy Consumption, 1991: 7,162 trillion Btu (coal, 64; natural gas, 2,024; petroleum, 3,283; nuclear electric power, 339; hydroelectric power, 283; other, 166; net interstate flow of electricity and associated losses, 1,003).

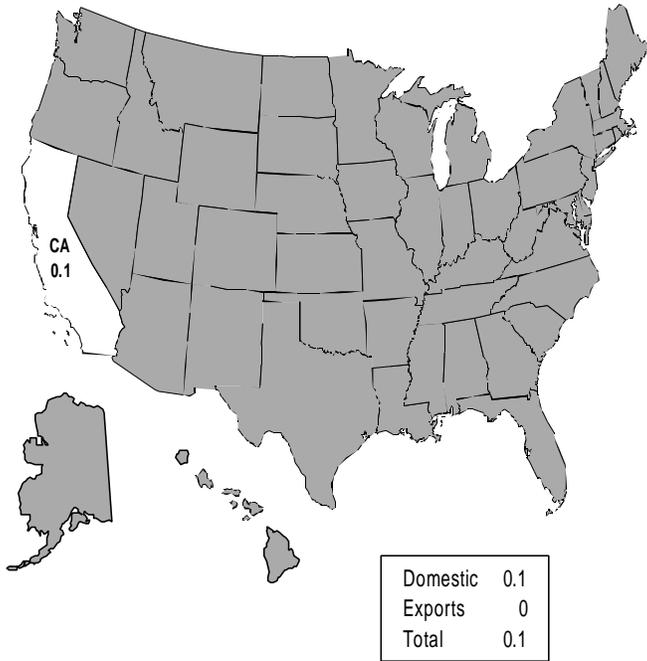
W = Withheld to avoid disclosure of individual company data.

NA = Not available.

Notes: **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. Number of miners, and productivity, mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Totals may not equal sum of components because of independent rounding. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*. Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

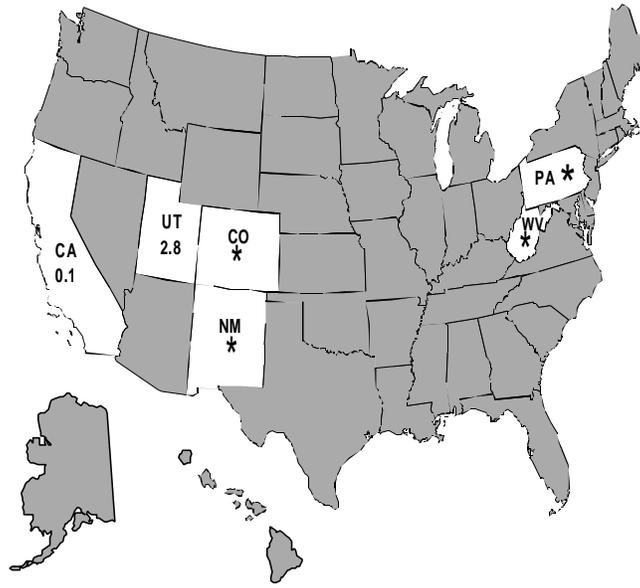
Destination of Coal Produced in California, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): truck, 100.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in California, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	3.0
-------	-----

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Colorado

The value of coal production in Colorado in 1992 accounted for about 22 percent of the estimated total value of all mineral commodities produced in the State and ranked second in importance to crude oil. Coal output from leases on Federal lands generated about \$31 million in royalties, which were equally shared by the State and Federal Governments.

Colorado's coal occurs in scattered regions that underlie more than one-fourth of the State. All ranks of coal are present, from lignite to anthracite. Current production, however, consists of slightly more than half bituminous coal and the rest subbituminous coal. Some of the bituminous coal was produced for use in making metallurgical coke. Since 1983, when the State's only iron and steel operation closed, all the coking coal mined in Colorado has been shipped out of State. Of the more than 20 coalbeds mined in 1992, the leading sources of production were the Wadge and D coalbeds and coalbeds in the Williams Fork Formation.

Coal was mined commercially in the Denver region in the early 1860's, first for domestic heating and then later for use in blast furnaces. With the expansion of the railroads, Colorado's coal output became the largest in the West in the 1900's. Production reached about 12 million short tons by 1920. It declined during the Depression, rose during World War II, only to drop again as markets were lost to natural gas and to the replacement of coal-burning locomotives with diesel-powered locomotives. A strong rise in the State's annual coal production began in the 1970's. This was due mainly to the opening of several large underground and surface mines to meet a growing demand from electric utilities for the low-sulfur coal present

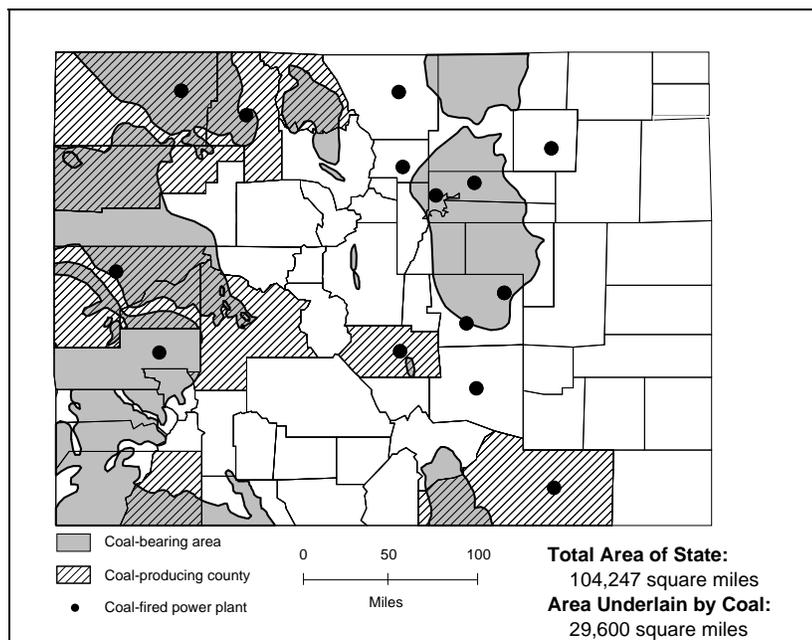
in the State. Colorado's coal output was 19 million short tons in 1992.

Early coal mining in Colorado was almost exclusively by underground methods. Surface mining in the State began in 1909 in Jackson County. The amount of surface-mined coal increased gradually, rising to account for more than half of Colorado's annual coal output in most of the 1970's, all of the 1980's, and slightly less than half in recent years. The largest coal mine in Colorado in 1992, with production of more than 4 million short tons, was the Colowyo surface mine of Colowyo Coal Company, in Moffatt County. Moffatt and Routt counties were the major coal producers. About two-thirds of Colorado's 1992 coal production was from Federal leases.

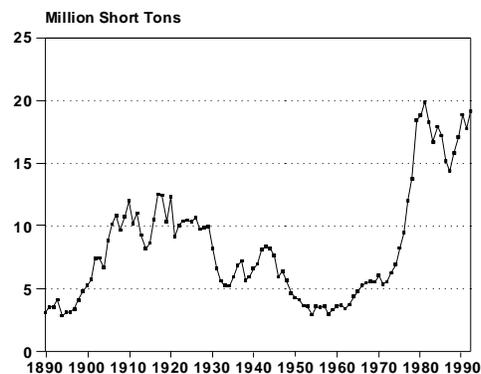
Less than two-thirds of the coal shipped from Colorado's mines in 1992 was to consumers in the State. Texas and Utah were the principal out-of-State destinations. Most of the coal was for electric utilities. The small amount of coking coal produced was shipped to Utah and Illinois. Some coal was also exported overseas.

Electric utilities accounted for nearly all of the 17 million short tons of coal consumed in Colorado in 1992. The State's mines supplied more than two-thirds of the utility coal, with Wyoming coal making up the balance. Colorado's largest coal-fired generating units, totaling 1,264 megawatts, are in the Craig plant of Colorado-Ute Electric Association, Inc., in Moffat County. Of the coal used in other sectors, malt beverage manufacturing and cement plants were the largest consumers.

Colorado



Coal Production, 1890-1992



First Year of Documented Coal
Production 1864 (500 short tons)
Peak Year of Coal
Production 1981 (19,897,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	12,128	4,828	16,956
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	5,631	418	6,049
0.61-1.67 (medium sulfur)	651	3,367	4,017
> 1.67 (high sulfur)	83	14	97
Total	6,365	3,799	10,163
Estimated Recoverable Reserves at Active Mines, Year-End 1992	400	208	608

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	5,721	6,377	10,628	9,601	10,246
Mines	26	23	16	16	15
Miners	2,408	1,464	1,509	1,530	1,085
Productivity (short tons per miner per hour)	1.18	2.16	3.26	4.23	4.52
Average Mine Price (dollars per short ton)	27.24	28.91	24.27	24.09	21.80
Surface					
Quantity (thousand short tons)	13,125	10,865	8,281	8,233	8,981
Mines	17	12	7	5	6
Miners	1,503	1,087	500	507	525
Productivity (short tons per miner per hour)	3.94	4.78	6.86	6.51	6.52
Average Mine Price (dollars per short ton)	16.43	22.16	18.53	19.96	20.80
Total					

Colorado

Quantity (thousand short tons)	18,846	17,243	18,910	17,834	19,226
Mines	43	35	23	21	21
Miners	3,911	2,551	2,009	2,037	1,610
Productivity (short tons per miner per hour)	2.26	3.30	4.24	5.05	5.27
Average Mine Price (dollars per short ton)	19.89	24.65	21.75	22.18	21.33

Colorado

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	4	71	2	13	5	16	4	<1
Surface	3	92	0	0	2	8	1	<1
All Mines	7	80	2	7	7	12	5	1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	10,124	14,295	15,924	15,416	15,902
Coke Plants	W	0	0	0	0
Other Industrial	W	W	729	738	735
Residential and Commercial	W	W	58	65	58
Total	11,981	15,242	16,710	16,218	16,696
Year-End Utility Stocks					
(thousand short tons)	6,367	4,989	3,298	3,466	3,410
Electricity Generation					
Total (million kilowatthours)	23,638	28,812	31,313	31,038	31,848
Coal (percent)	79	91	95	93	94
Nuclear (percent)	3	<1	0	0	0
Other (percent)	18	9	5	7	6

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	21.57	19.84
Sulfur Content (percent by weight) .....	.42	.38
Ash Content (percent by weight)	8.26	7.01
Pounds of Sulfur per million Btu .....	.39	.38
Dollars per million Btu	1.37	1.09
Dollars per short ton	29.51	21.67

Colorado

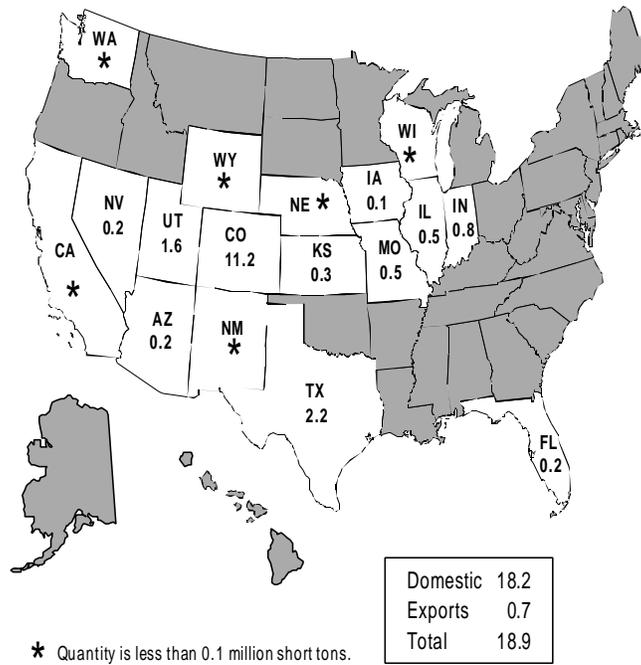
Estimated Total State Energy Consumption, 1991: 964 trillion Btu (coal, 322; natural gas, 268; petroleum, 345; nuclear electric power, 0; hydroelectric power, 17; other, 0; net interstate flow of electricity and associated losses, 12).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates* Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Colorado, 1992
(Million Short Tons)

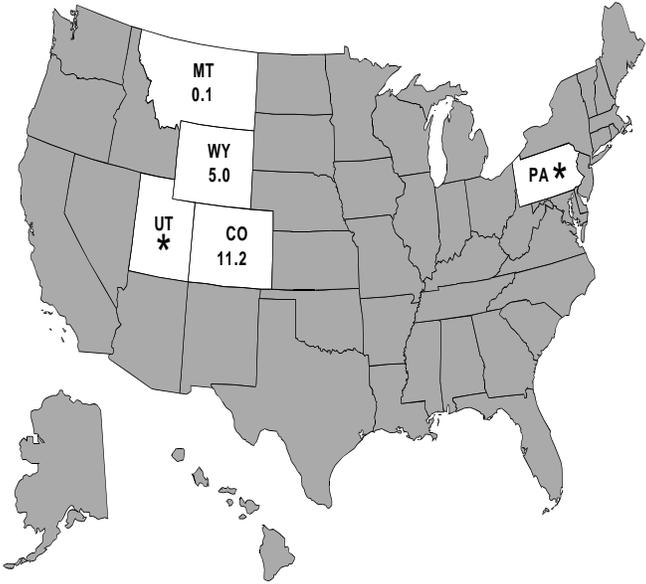


Transportation modes, domestic markets (percent): rail, 75; water, 1; truck, 23; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Colorado, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	16.3
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Illinois

Coal is the most valuable mineral resource in Illinois. Coal production in recent years has accounted for about 60 percent of the estimated total value of all mineral production in the State, including crude oil and natural gas.

Coal is abundant in Illinois, underlying two-thirds of the State in a large geologic depression called the Illinois Basin. The minable coalbeds are relatively thick, generally flat-lying, and continuous over extensive areas. Illinois coal is bituminous in rank and has a high sulfur content, a characteristic that hampers its use because of environmental concerns for air quality. Even when cleaned, the sulfur content is high, averaging 2 to 3 percent (by weight). The major coalbed among the eight mined in 1992 was the No. 6 (also known as the "Herrin"), which averages more than 6 feet in thickness. Some coal produced in the State is suitable for conversion into metallurgical coke.

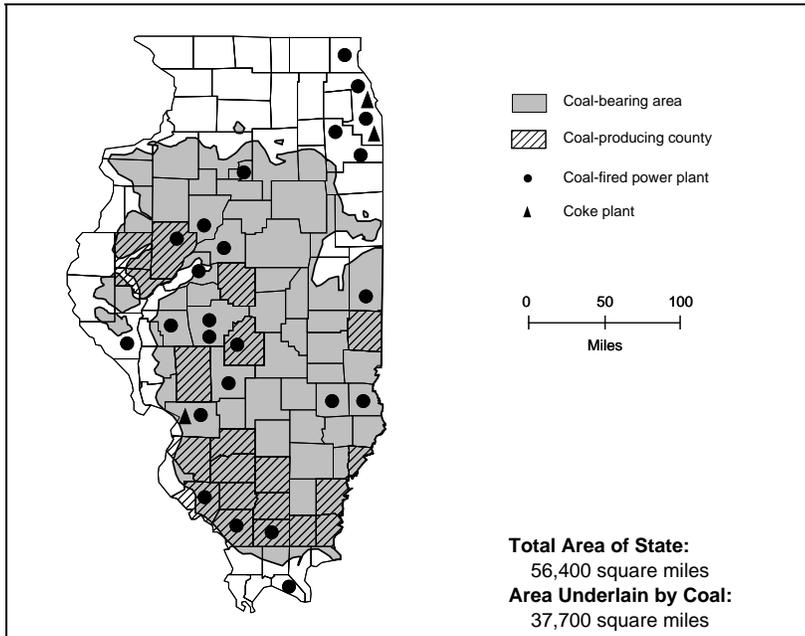
Coal was first reported in what is now Illinois by French-Canadian explorers who noted an outcrop along the Illinois River on a map made in the 1670's, recording for the first time the presence of coal in what is now the United States. Coal production began in the State in the early 1800's and, spurred by industrial development and railroad expansion, rose to an all-time high of 89 million short tons in 1918. Afterwards, coal output went into a general decline, dropping markedly during the Depression. It rose to meet the demands of World War II, but later decreased due to competition from oil and gas and the conversion of railroad locomotives from coal to diesel-electric power. Beginning around 1960, increased demand for utility coal raised the production level. Since then, however, the demand for Illinois coal has been constrained because of such

factors as the enactment of clean air standards, a decline in the demand for coking coal, and the development of nuclear electric power in the State. In recent years, about 60 million short tons of coal have been produced annually in Illinois.

About two-thirds of the coal produced in Illinois since 1980 was from underground mines, historically the chief source of production. Most of the mines are very large operations, producing at an annual rate exceeding 1 million short tons each. The largest mine in 1992, producing over 3 million short tons, was the Captain surface mine of Arch of Illinois, in Perry County. Over 95 percent of the State's coal output is cleaned. The Captain coal preparation plant, near Percy, is the second-largest coal-cleaning facility in the United States, with a processing capacity of 2,850 short tons per hour. Perry, Saline, and Franklin Counties were the State's leading coal producers.

More than two-thirds of the coal produced in Illinois in 1992 was shipped out of State, chiefly to Missouri and Indiana. About 1 million short tons of Illinois coal was exported to overseas markets. About 80 percent of the 32 million short tons of coal consumed in Illinois in 1992 was used to generate electricity. Nearly 60 percent of the utility coal was from Illinois, with most of the balance being low-sulfur coal from Wyoming and Montana. The largest coal-fired generating facility in Illinois is the 1,680-megawatt Baldwin plant of Illinois Power Company, in Randolph County. Metallurgical coke was made from coal received from West Virginia, Virginia, and Kentucky. Other coal-consuming industries were largely manufacturers of food, chemical products, and cement.

Illinois



Coal Production, 1890-1992



First Year of Documented Coal Production 1833 (6,000 short tons)
Peak Year of Coal Production 1918 (89,291,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	62,732	15,385	78,117
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	0	0
0.61-1.67 (medium sulfur)	3,440	232	3,672
> 1.67 (high sulfur)	21,979	4,440	26,419
Total	25,419	4,672	30,091
Estimated Recoverable Reserves at Active Mines, Year-End 1992	1,135	64	1,199

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	34,969	37,343	41,671	43,134	46,965
Mines	31	34	28	33	29
Miners	12,610	10,349	7,407	7,056	6,780
Productivity (short tons per miner per hour)	1.49	1.92	2.70	2.88	3.21
Average Mine Price (dollars per short ton)	25.58	31.78	28.30	29.05	27.93
Surface					
Quantity (thousand short tons)	27,574	21,858	18,722	17,124	12,892
Mines	28	20	17	18	14
Miners	5,125	3,509	2,611	2,046	1,543
Productivity (short tons per miner per hour)	2.70	2.69	3.64	4.30	4.47
Average Mine Price (dollars per short ton)	22.86	29.14	26.45	26.59	26.69

Illinois

Total

Quantity (thousand short tons)	62,543	59,201	60,393	60,258	59,857
Mines	59	54	45	51	43
Miners	17,735	13,858	10,018	9,102	8,323
Productivity (short tons per miner per hour)	1.86	2.14	2.94	3.18	3.42
Average Mine Price (dollars per short ton)	24.39	30.80	27.73	28.35	27.66

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	23	94	3	5	1	<1	2	<1
Surface	4	70	4	20	3	9	3	1
All Mines	27	89	7	9	4	2	5	<1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	34,610	31,608	27,396	27,754	25,338
Coke Plants	1,810	2,358	W	W	W
Other Industrial	3,265	3,399	3,888	4,426	3,839
Residential and Commercial	155	236	W	W	W
Total	39,840	37,601	33,904	34,677	31,776
Year-End Utility Stocks					
(thousand short tons)	11,681	6,977	7,398	6,977	7,399
Electricity Generation					
Total (million kilowatthours)	103,420	103,667	126,977	127,851	124,837
Coal (percent)	65	61	42	42	40
Nuclear (percent)	27	38	57	56	59
Other (percent)	8	1	1	2	1

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	22.51	21.33
Sulfur Content (percent by weight)	2.63	1.91
Ash Content (percent by weight)	9.33	8.19
Pounds of Sulfur per million Btu	2.34	1.79
Dollars per million Btu	1.58	1.74
Dollars per short ton	35.52	37.06

Illinois

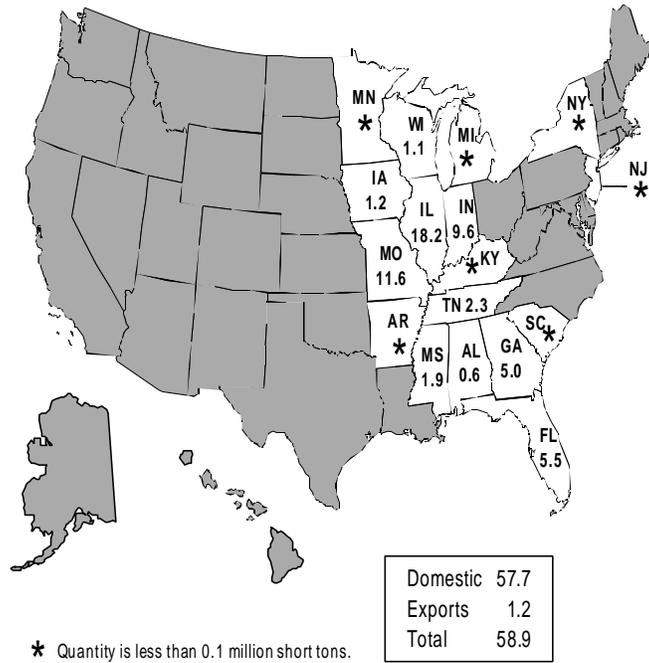
Estimated Total State Energy Consumption, 1991: 3,513 trillion Btu (coal, 758; natural gas, 1,006; petroleum, 1,111; nuclear electric power, 772; hydroelectric power, 1; other, 0; net interstate flow of electricity and associated losses, -134).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates* Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

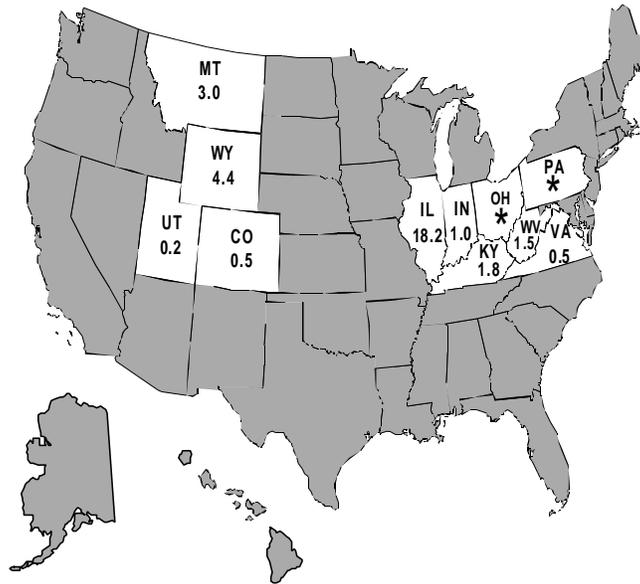
Destination of Coal Produced in Illinois, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 54; water, 35; truck, 8; tramway/conveyor, 3; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Illinois, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	31.2
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Indiana

Indiana's mineral wealth lies mostly in its coal deposits, located in a triangular area in the southwestern part of the State. In 1992, coal production from the area accounted for an estimated 60 percent of the total value of all mineral production in Indiana.

The Indiana coalfield composes the eastern part of the Illinois Basin, a large geologic depression that also underlies parts of Illinois and Kentucky. The coalbeds, which average more than 4 feet in thickness, are exposed or at shallow depths in the eastern part of the field and gradually become deeper westward. The use of Indiana's coal, all bituminous in rank, is environmentally handicapped by its high sulfur content, which averages more than 2 percent by weight. Production in 1992 was from about 15 coalbeds. The principle beds were the No. VI and No. V, which average about 5 feet in thickness.

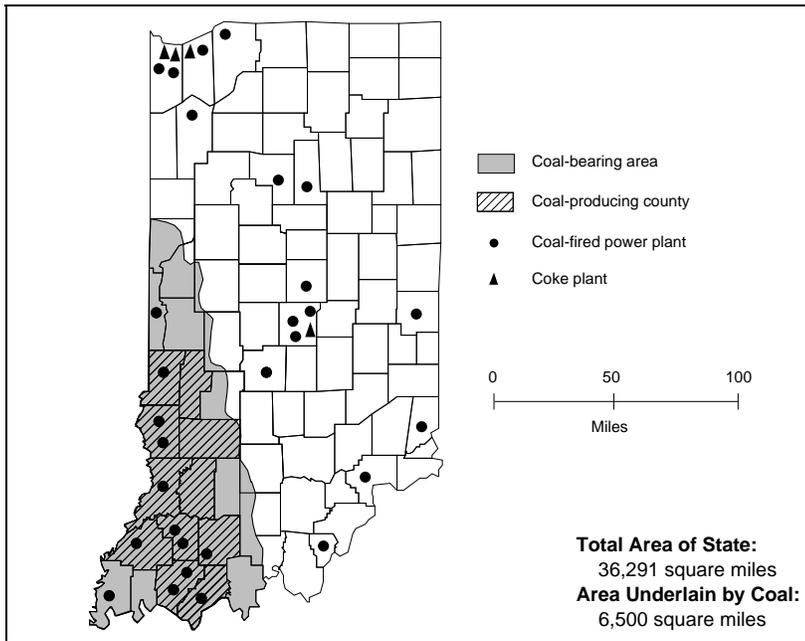
Coal was first discovered in Indiana along the Wabash River in 1736. By 1832, coal was being advertised for sale, and in 1837, the first coal company was officially incorporated and granted a charter by the State. By 1840, coal was being shipped on flatboats on the Wabash and other rivers. Indiana's coal output totaled more than 6 million short tons in 1900, rose to 31 million short tons during World War I, and then declined because of the Depression and competition from petroleum. Production increased to 28 million short tons during World War II, only to slump afterwards as many consumers switched to oil and natural gas and the railroads replaced coal-burning locomotives with diesel-electric locomotives. In the 1960's, an increased demand for utility coal spurred production. A record of 38 million short tons was produced in 1984 as utilities built up stockpiles, spurring

production, in anticipation of a major coal miners' strike. Production has since declined and, in 1992, was 30 million short tons.

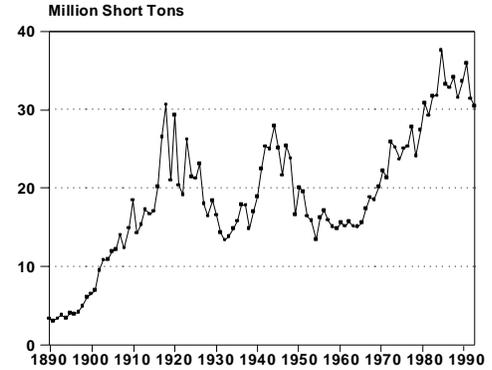
Nearly all of Indiana's coal production is from surface mining, which began in the State in 1918. The amount of surface-mined coal has increased almost steadily, and by the 1940's it usually exceeded the tonnage from underground mines. The State's largest producer in 1992, with about 3 million short tons, was the Old Ben No. 1 surface mine of Zeigler Coal Company, in Pike County. Warrick, Sullivan, Daviess, and Pike counties were the leading sources of Indiana's coal production.

About three-fourths of the coal produced in Indiana in 1992 was for consumption in the State. Out-of-State shipments were mostly to power plants in Kentucky, Wisconsin, and Illinois. In 1992, Indiana's coal consumption totaled 59 million short tons, ranking it the second-largest coal-consuming State after Texas. Most of the coal consumed in Indiana was used to generate electricity. More than 40 percent of the utility coal was from mines in Indiana, with Wyoming and Illinois supplying most of the balance. Indiana's largest coal-burning generating facility, with 3,140 megawatts, is the Gibson plant of Public Service Company of Indiana, in Gibson County. This is the third-largest coal-fired power plant in the United States. Indiana's coke plants carbonize coal produced mostly from West Virginia, Virginia, and Kentucky; none of the coal was from Indiana. In 1992, Indiana's coke output was the Nation's second largest, following Pennsylvania. Most of the coal consumed by other industries was used as a source of heat by manufacturers of aluminum and steel.

Indiana



Coal Production, 1890-1992



First Year of Documented Coal Production 1840 (9,682 short tons)
Peak Year of Coal Production 1984 (37,555,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	8,890	1,221	10,111
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	249	69	318
0.61-1.67 (medium sulfur)	726	147	872
> 1.67 (high sulfur)	2,708	498	3,205
Total	3,682	714	4,396
Estimated Recoverable Reserves at Active Mines, Year-End 1992	W	W	405

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	688	2,053	3,037	2,832	2,641
Mines	4	4	5	4	4
Miners	133	455	524	447	422
Productivity (short tons per miner per hour)	2.26	1.79	2.90	2.97	2.80
Average Mine Price (dollars per short ton)	W	28.84	W	W	W
Surface					
Quantity (thousand short tons)	30,185	31,262	32,870	28,636	27,825
Mines	83	66	59	54	47
Miners	5,182	4,732	3,671	3,472	3,230
Productivity (short tons per miner per hour)	2.88	2.97	3.96	4.17	4.28
Average Mine Price (dollars per short ton)	W	26.39	W	W	W

Total

Indiana

Quantity (thousand short tons)	30,873	33,316	35,907	31,468	30,466
Mines	87	70	64	58	51
Miners	5,315	5,187	4,195	3,919	3,652
Productivity (short tons per miner per hour)	2.86	2.85	3.84	4.02	4.09
Average Mine Price (dollars per short ton)	20.72	26.54	23.91	23.58	23.41

Indiana

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	1	42	1	31	2	27	0	0
Surface	7	52	12	29	19	18	9	1
All Mines	8	51	13	29	21	19	9	1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	33,664	38,310	47,654	47,720	46,943
Coke Plants	11,989	9,338	8,867	8,234	7,153
Other Industrial	4,610	5,119	4,629	4,404	4,260
Residential and Commercial	222	524	551	433	411
Total	50,485	53,291	61,701	60,790	58,767
Year-End Utility Stocks					
(thousand short tons)	12,262	11,322	10,610	9,953	11,294
Electricity Generation					
Total (million kilowatthours)	70,618	78,484	97,738	98,200	97,304
Coal (percent)	99	99	98	98	98
Nuclear (percent)	0	0	0	0	0
Other (percent)	1	1	2	2	2

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	22.29	21.26
Sulfur Content (percent by weight)	2.46	1.88
Ash Content (percent by weight)	9.07	8.43
Pounds of Sulfur per million Btu	2.21	1.77
Dollars per million Btu	1.24	1.31
Dollars per short ton	27.68	27.89

Indiana

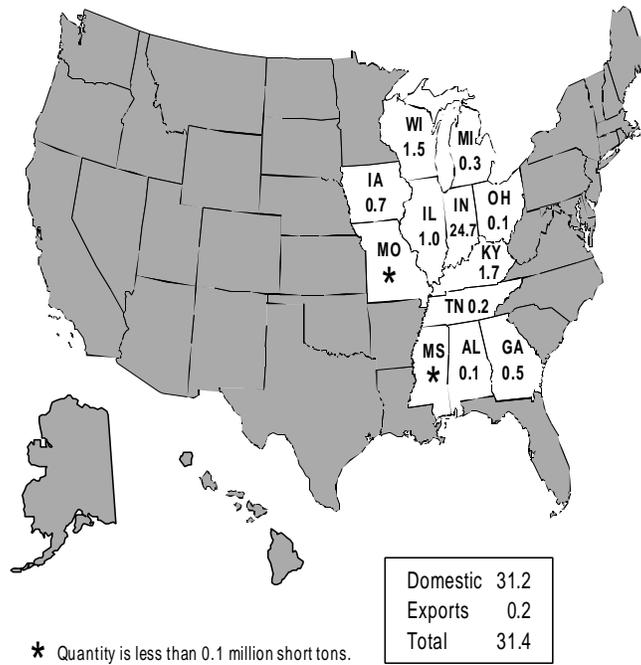
Estimated Total State Energy Consumption, 1991: 2,421 trillion Btu (coal, 1,340; natural gas, 464; petroleum, 806; nuclear electric power, 0; hydroelectric power, 4; other, 0; net interstate flow of electricity and associated losses, -193).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

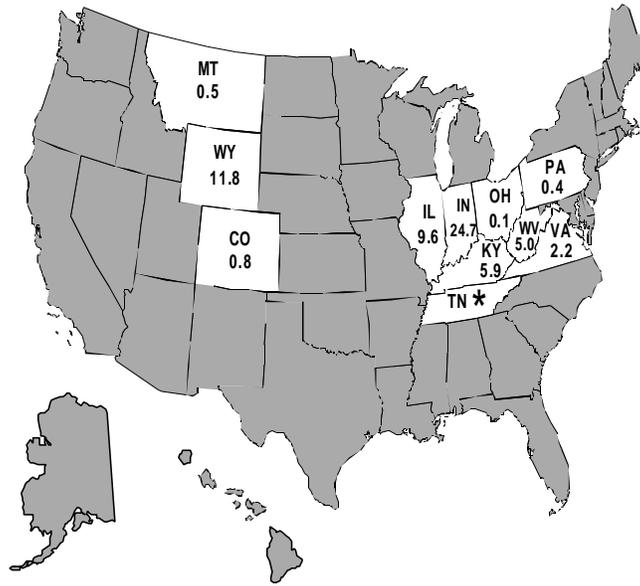
Destination of Coal Produced in Indiana, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 55; water, 16; truck, 27; tramway/conveyor, 2; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Indiana, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	61.0
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Iowa

Bituminous coal is the only fossil fuel produced in Iowa. The coal output is small. The 289,000 short tons produced in 1992 ranked it 25th among the 27 coal-producing States. The value of the coal production was less than 2 percent of the estimated total value of all mineral commodities produced in Iowa.

Iowa's coal-bearing areas, located in the northern part of the Western Interior coal region, underlie about one-third of the State. The coalbeds are often discontinuous and limited in extent. The coal is bituminous in rank. Although Iowa coal has a relatively high heat content, averaging around 20 million Btu per short ton, its use is limited because of its high sulfur content, which averages more than 3 percent by weight. Before use, it is blended with low-sulfur coal from other States to meet clean air regulations.

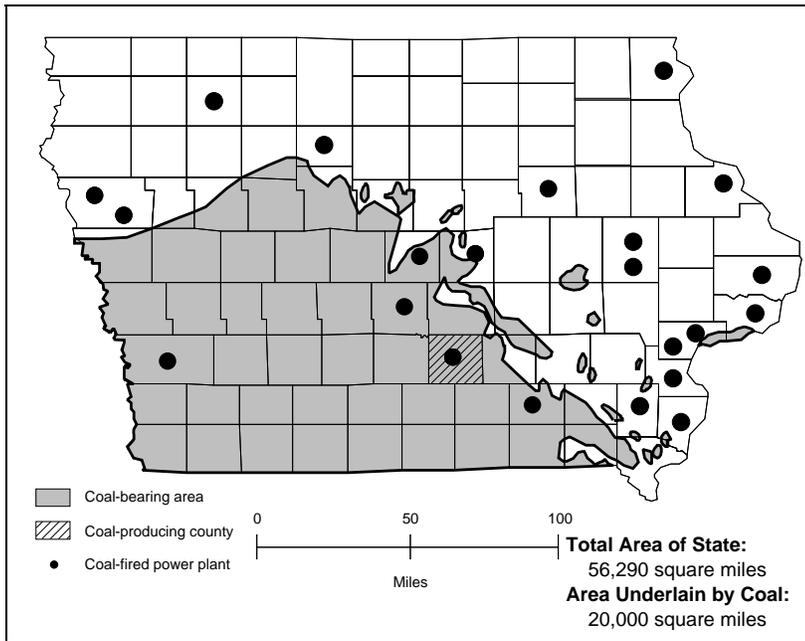
Coal production in Iowa dates back to 1840, when a mine at Farmington, Van Buren County, supplied local markets and steamships that plied the Des Moines River. Following the Civil War, extensive railroad construction in Iowa provided access to new markets for Iowa coal producers and also increased the demand for coal as a railroad fuel. Iowa coal became an important source of coal for locomotives heading westward across the Great Plains. Before 1900, coal mining was a major industry in the State, and Iowa was the leading coal producing State west of the Mississippi River. Iowa's coal output peaked in 1917 at 9 million short tons.

Afterwards, production dwindled as the railroads converted to diesel locomotives and other consumers switched to petroleum and natural gas or to better quality coal from other States, first from neighboring Illinois and, more recently, from Wyoming. Iowa's annual coal production dropped below 1 million short tons in the late 1960's, and has been less than 500,000 short tons since 1985.

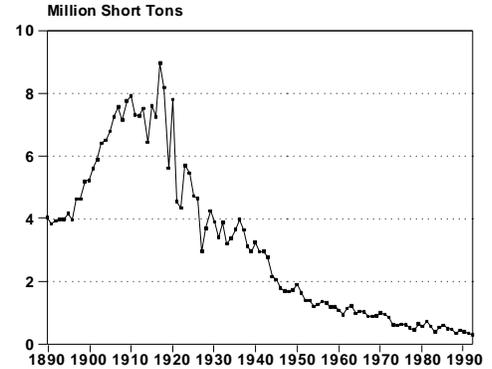
Iowa's coal output in 1992 was entirely from Marion County, in the southern part of the State. All production was from the Ford coalbed (also known as the Lower Ford and the Cherokee), which is about 4 feet thick. Production was all from surface mines; the last underground mine in Iowa closed in 1990. The American No. 1 surface mine of American Coals Corporation was the leading producer in 1992.

Virtually all of the coal produced in Iowa in 1992 was used within the State for electricity generation. However, considerably more coal was consumed in the State than was produced. Most of the 18 million short tons consumed in 1992 was from Wyoming. By far, electric utilities were the leading coal consumers in Iowa. The major coal-burning generating facility is the 950-megawatt George Neal North plant of Iowa Public Service Company, in Woodbury County. Coal was also used in Iowa as a source of heat in corn milling to produce syrup, starch, and similar products.

Iowa



Coal Production, 1890-1992



First Year of Documented Coal Production 1840 (400 short tons)
Peak Year of Coal Production 1917 (8,966,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	1,733	458	2,190
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	0	0
0.61-1.67 (medium sulfur)	0	0	0
> 1.67 (high sulfur)	807	320	1,128
Total	807	320	1,128
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	166	172	< 1	0	0
Mines	1	1	1	0	0
Miners	31	42	NA	0	0
Productivity (short tons per miner per hour)	2.07	1.77	NA	--	--
Average Mine Price (dollars per short ton)	W	W	NA	--	--
Surface					
Quantity (thousand short tons)	393	419	381	344	289
Mines	5	4	2	3	2
Miners	112	100	135	97	101
Productivity (short tons per miner per hour)	1.59	1.78	1.45	1.29	1.14
Average Mine Price (dollars per short ton)	W	W	W	W	W

Total

Iowa

Quantity (thousand short tons)	559	591	381	344	289
Mines	6	5	3	3	2
Miners	143	142	135	97	101
Productivity (short tons per miner per hour)	1.70	1.78	1.45	1.29	1.14
Average Mine Price (dollars per short ton)	21.33	26.13	W	W	W

Iowa

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	0	0	0	0	1	88	1	12
All Mines	0	0	0	0	1	88	1	12

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	10,745	12,491	15,331	15,846	15,209
Coke Plants	0	0	0	0	0
Other Industrial	1,505	1,572	2,353	2,672	2,571
Residential and Commercial	90	278	245	223	64
Total	12,340	14,342	17,929	18,741	17,844
Year-End Utility Stocks					
(thousand short tons)	5,834	4,416	4,206	4,499	4,349
Electricity Generation					
Total (million kilowatthours)	21,805	23,474	29,048	31,228	29,251
Coal (percent)	81	87	86	83	84
Nuclear (percent)	12	8	10	13	12
Other (percent)	7	5	4	4	4

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	19.63	17.73
Sulfur Content (percent by weight)	4.36	.67
Ash Content (percent by weight)	13.57	5.78
Pounds of Sulfur per million Btu	4.44	.76
Dollars per million Btu	1.71	1.10
Dollars per short ton	33.50	19.58

Iowa

Estimated Total State Energy Consumption, 1991: 937 trillion Btu (coal, 346; natural gas, 235; petroleum, 309; nuclear electric power, 45; hydroelectric power, 9; other, <1; net interstate flow of electricity and associated losses, -7).

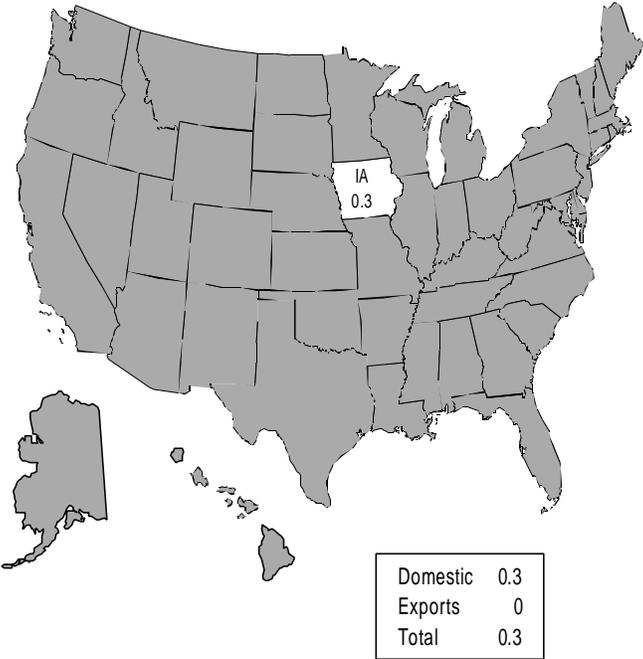
W = Withheld to avoid disclosure of individual company data.

NA = Not available.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

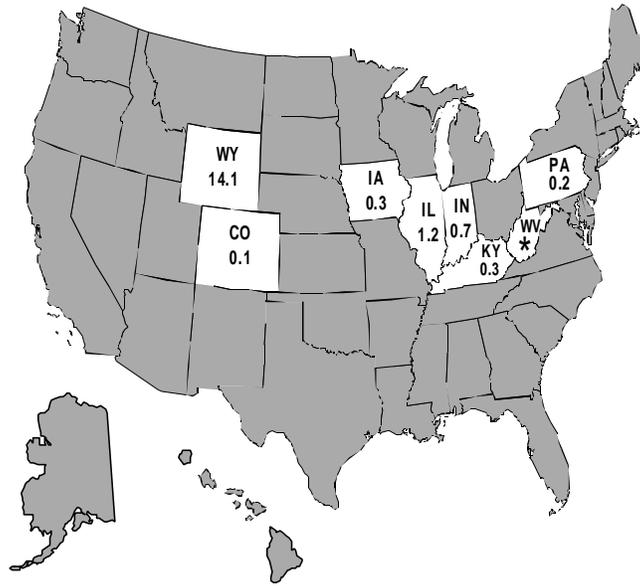
Destination of Coal Produced in Iowa, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): truck, 100.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Iowa, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	17.0
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Kansas

Coal mining is a relatively small industry in Kansas. Production in 1992 was estimated to account for less than 1 percent of the total value of all mineral commodities produced in the State.

Coal deposits underlie about one-fourth of Kansas. All of the economically important coal is bituminous in rank and located in the eastern part of the State. The minable coalbeds are generally flat-lying and average about 2 feet in thickness. Production in 1992 was from the Mineral and Croweburg coalbeds. Kansas coal has a high heat content, averaging more than 21 million Btu per short ton, but the use of the coal is constrained by its high sulfur content, which averages about 4 percent by weight.

Historically, coal production had an important role in the development of Kansas. Although coal was mined in the mid-1850's, the first commercially important coal production began in 1865 when a mine near Fort Scott, in southeastern Kansas, began supplying coal for railroad locomotives. Later, other coal mines were opened to meet a growing demand for coal for the railroads and for domestic and industrial customers, including the large zinc and lead industry that developed in southeastern Kansas and adjoining States.

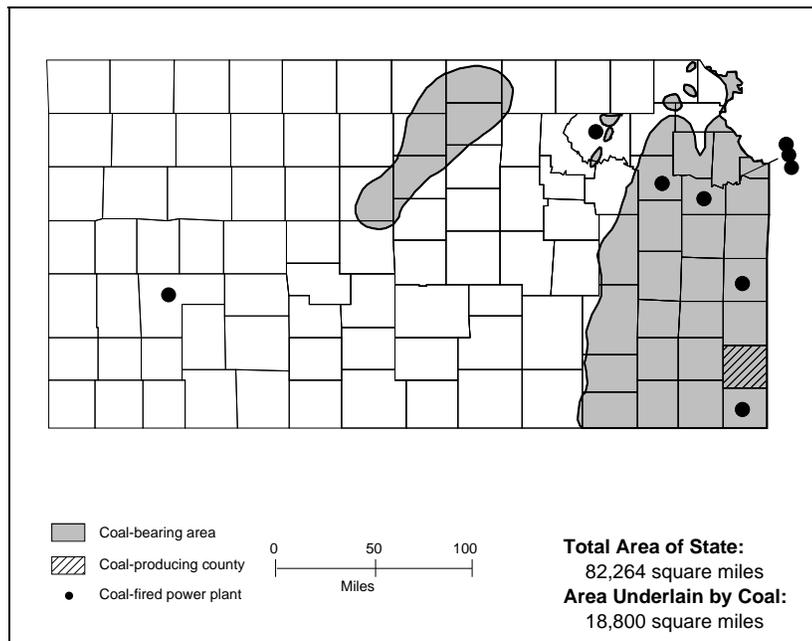
Coal production reached a peak of nearly 8 million short tons in 1918, when over 40 percent of the output was used by the railroads. Production in subsequent years trended downward, falling to 2 million short tons in the early 1930's. This was the result of a decline in economic activity due to the Depression, a drop in the railroad market as steam locomotives converted from coal to fuel oil, and competition in other markets from

the oil and natural gas produced from large fields discovered in the State. Although coal production increased to 4 million short tons during World War II, it declined sharply afterwards, due largely to competition from petroleum. Annual production in recent years has fallen below 1 million short tons and was 363,000 short tons in 1992.

Underground mines produced large amounts of coal in Kansas in the early years, but all the coal produced since 1964 has been from surface mines. Surface mining began in Kansas in the 1870's, when an early steam shovel was used to remove overburden from a coalbed near Pittsburg. As surface mining equipment improved, production from surface mines increased and in 1931 exceeded that from underground mines. In 1992, all production was from Crawford County. The leading producer was Clemens No. 2 strip mine of Clemens Coal Company. About half of the output was used in Kansas, and the rest was shipped to consumers in Missouri.

Contrasting with the small coal production in Kansas, annual coal consumption in Kansas has risen from less than 1 million short tons in the early 1970's and totaled 14 million short tons in 1992. Virtually all of the coal is used to generate electricity. This dramatic rise occurred because rising costs for oil and natural gas in the 1970's made coal the most economical fuel for power plants in the State. Of the total utility coal consumed in Kansas, most is low-sulfur subbituminous coal from Wyoming. Wyoming coal is used in the State's largest coal-fired generating facility, the 2,047-megawatt Jeffrey Energy Center of Kansas Power & Light Company, in Pottawatomie County. A small amount of coal is also used by cement plants in the State.

Kansas



Coal Production, 1890-1992



First Year of Documented Coal
Production 1869 (36,891 short tons)
Peak Year of Coal
Production 1918 (7,562,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	0	977	977
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	0	0
0.61-1.67 (medium sulfur)	0	0	0
> 1.67 (high sulfur)	0	684	684
Total	0	684	684
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	842	994	721	416	363
Mines	8	5	4	3	2
Miners	274	228	132	92	96
Productivity (short tons per miner per hour)	1.72	2.44	2.03	2.15	2.21
Average Mine Price (dollars per short ton)	26.54	26.00	W	W	W

Total

Kansas

Quantity (thousand short tons)	842	994	721	416	363
Mines	8	5	4	3	2
Miners	274	228	132	92	96
Productivity (short tons per miner per hour)	1.72	2.44	2.03	2.15	2.21
Average Mine Price (dollars per short ton)	26.54	26.00	W	W	W

Kansas

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	0	0	0	0	1	83	1	17
All Mines	0	0	0	0	1	83	1	17

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	10,035	14,351	15,018	14,732	14,068
Coke Plants	0	0	0	0	0
Other Industrial	331	363	157	148	158
Residential and Commercial	5	1	0	0	0
Total	10,371	14,715	15,175	14,881	14,227
Year-End Utility Stocks					
(thousand short tons)	4,667	3,513	3,729	3,310	2,747
Electricity Generation					
Total (million kilowatthours)	25,134	27,512	33,869	32,315	31,764
Coal (percent)	64	80	70	73	70
Nuclear (percent)	0	14	23	18	27
Other (percent)	36	6	7	9	3

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	24.39	17.80
Sulfur Content (percent by weight)	3.54	.49
Ash Content (percent by weight)	11.70	5.74
Pounds of Sulfur per million Btu	2.90	0.55
Dollars per million Btu	1.29	1.18
Dollars per short ton	31.57	20.99

Kansas

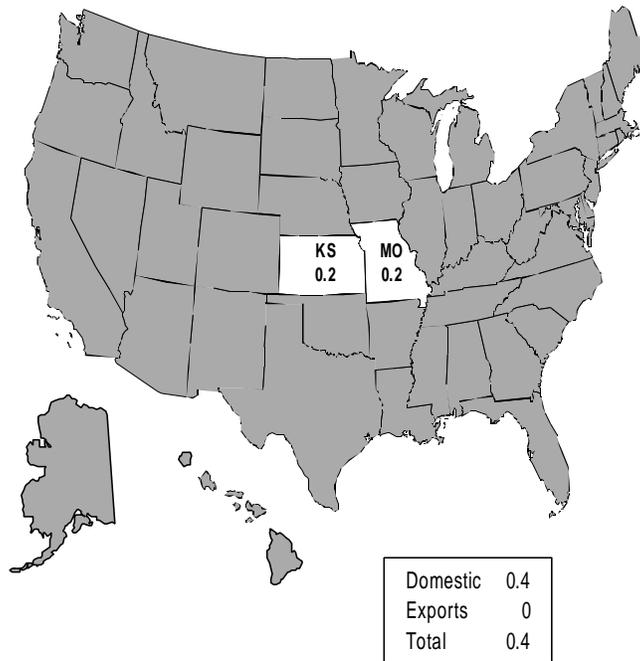
Estimated Total State Energy Consumption, 1991: 1,039 trillion Btu (coal, 269; natural gas, 372; petroleum, 395; nuclear electric power, 63; hydroelectric power, <1; other, 0; net interstate flow of electricity and associated losses, -59).

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

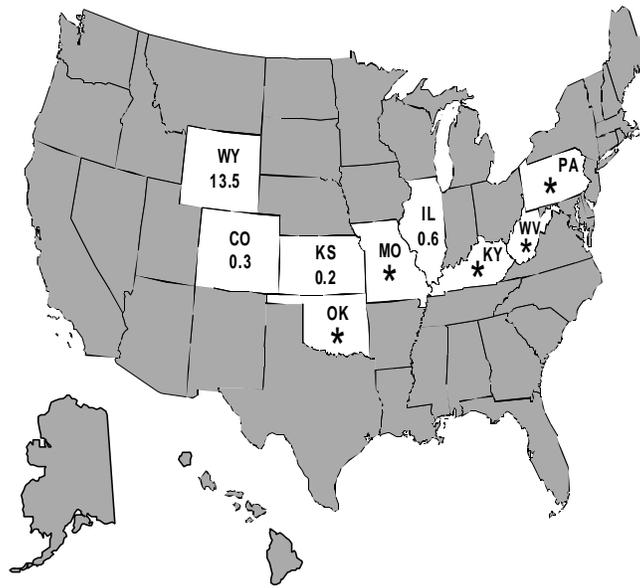
Destination of Coal Produced in Kansas, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 6; truck, 92; unknown, 2.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Kansas, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	14.8
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Kentucky

Kentucky is one of the major coal-producing States, with an annual output averaging over 160 million short tons in recent years. It was the Nation's leading coal producer until 1988, holding that position for over a decade before losing it to Wyoming. In 1992, Kentucky was the third-leading coal-producing State, following Wyoming and West Virginia. Coal is by far the most important mineral commodity produced in Kentucky. The 1992 coal output was estimated to represent about 90 percent of the total value of all minerals produced, including oil and gas. Royalties from Federal coal leases totaled close to \$1 million, which was disbursed equally to the State and the Federal Government.

Kentucky's economic coal deposits consist of bituminous coal. The State's two coalfields, one in the East and the other in the West, are separated by a large geologic uplift, the Cincinnati arch. The eastern field, the larger of the two, is part of the Appalachian coal basin. The western field is a continuation of the Illinois coal basin, which also underlies parts of Illinois and Indiana. The coalfields are distinct in several ways due to different geologic conditions of coal formation in each area.

The eastern field contains more than 40 minable coalbeds, ranging from 2 to 4 feet in thickness. The coal generally has a heat content of about 26 million Btu per short ton and a sulfur content of 1 to 2 percent, by weight. Premium-grade metallurgical coal is present in some areas. By comparison, the western field has less than 20 minable coalbeds, which average 5 feet in thickness. The heat content of the coal is slightly lower than in the eastern field, but the sulfur content is higher, about 3 to 4 percent, which is an environmental short-coming. The metallurgical coal found in western Kentucky is low grade. Because of these differences in coal quality, the eastern field has become Kentucky's chief source of coal production and the only area in the State where metallurgical coal is mined. In the eastern field, the major coalbeds in 1992 were the Hazard No. 4, Hazard, and Lower Elkhorn. In the western field, the No. 9 coalbed accounted for about half of production.

Coal was discovered in Kentucky in the mid-1700's, but production was small until the mid-1800's. The industry

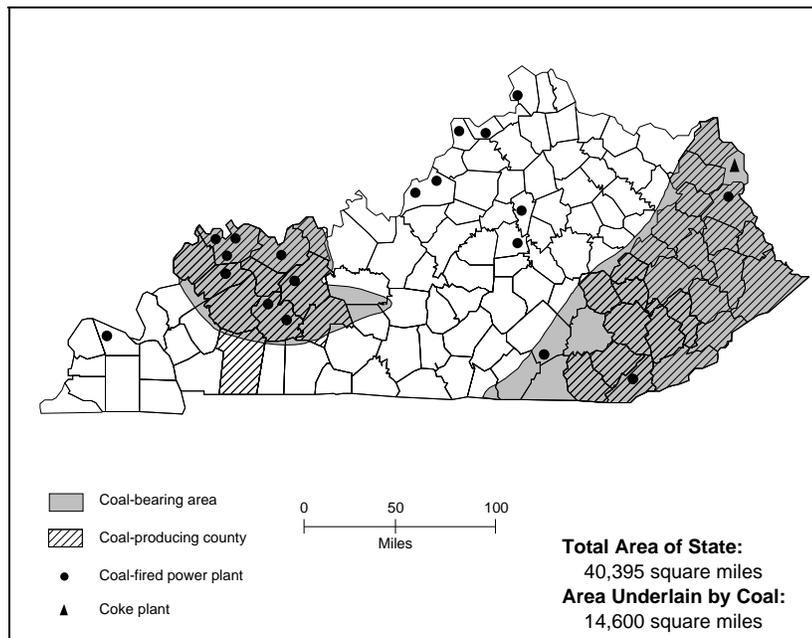
developed rapidly after 1910 as railroads were expanded into the coalfields. Early production was used in local iron furnaces, as a source of heat for salt production, and as fuel for locomotives and river steamers. Coal production exceeded 5 million short tons at the turn of the century, rose to about 69 million short tons in 1927, and then dropped to half that amount during the Depression years. Responding to the demands of World War II and the postwar Marshall Plan, Kentucky's coal output rose to 84 million short tons in 1947. Afterwards, production declined in the face of competition from petroleum, including the replacement of coal-fired locomotives with diesel-electric engines. The 1960's saw annual production recover and trend upward, due mainly to a growing market for utility coal. Production reached a record of 173 million short tons in 1990 and was 161 million short tons in 1992.

Nearly 60 percent of Kentucky's coal output is from underground mines, historically the principal source of production. Surface mining, which began in the 1920's, has increased almost steadily since World War II. During some years in the 1970's and early 1980's, surface mines produced more than half of the State's coal. Although Kentucky has the largest number of coal mines in the United States, more than half are small mines that annually produce less than 100,000 short tons each. As a result, the bulk of the State's coal production is from the relatively few larger mines. The State's largest mine in 1992, producing about 4 million short tons, was the No. 9 Wheatcroft underground mine of Costain Coal Inc., in Webster County. Pike County was by far Kentucky's leader in tonnage, with about one-fourth of the total. Federal leases accounted for less than 1 percent of the State's coal output in 1992. Kentucky's coal mining labor force in 1992 was the Nation's second largest after West Virginia.

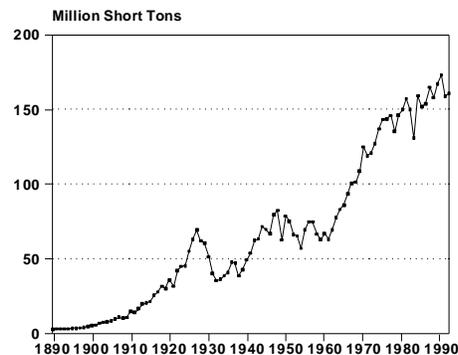
Most of Kentucky's coal produced in 1992 was shipped out of the State. About 90 percent was marketed domestically, nearly all in the East, and the rest was exported. Coal consumption in Kentucky in 1992 totaled 35 million short tons, most of it from the State's coalfields. Electric utilities were the major coal consumers, using mostly Kentucky coal supplemented by small amounts

from West Virginia and Indiana. The largest coal-burning generating facility is the 2,159-megawatt Paradise plant of the Tennessee Valley Authority, in Muhlenberg County. Small amounts of coal, mostly from Kentucky and West Virginia, were also used to produce metallurgical coke and as sources of heat, chiefly in the manufacture of plastics and similar products, inorganic chemicals, metals, and lime.

Kentucky



Coal Production, 1890-1992



First Year of Documented Coal Production 1828 (328 short tons)
Peak Year of Coal Production 1990 (173,322,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	23,708	5,368	29,077
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	1,908	367	2,274
0.61-1.67 (medium sulfur)	1,891	653	2,544
> 1.67 (high sulfur)	7,246	2,306	9,552
Total	11,045	3,325	14,370
Estimated Recoverable Reserves at Active Mines, Year-End 1992	1,024	429	1,453

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	79,162	81,236	105,290	97,332	96,053
Mines	647	921	627	542	482
Miners	30,581	22,877	20,898	18,481	16,888
Productivity (short tons per miner per hour)	1.41	1.94	2.54	2.71	2.91
Average Mine Price (dollars per short ton)	30.06	29.15	25.24	25.92	25.18
Surface					
Quantity (thousand short tons)	70,982	71,036	68,032	61,647	65,016
Mines	503	937	360	296	270
Miners	15,814	13,937	9,600	8,161	7,736
Productivity (short tons per miner per hour)	2.32	2.69	3.43	3.66	3.75
Average Mine Price (dollars per short ton)	25.05	27.19	25.11	24.70	23.50
Total					

Kentucky

Quantity (thousand short tons)	150,144	152,272	173,322	158,980	161,068
Mines	1,150	1,858	987	838	752
Miners	46,395	36,814	30,498	26,642	24,624
Productivity (short tons per miner per hour)	1.74	2.23	2.83	3.01	3.20
Average Mine Price (dollars per short ton)	27.62	28.24	25.19	25.45	24.50

Kentucky

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	20	40	16	11	161	38	285	11
Surface	14	37	24	25	85	32	147	6
All Mines	34	39	40	17	246	36	432	8

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	24,383	27,085	30,867	31,432	31,715
Coke Plants	905	W	W	W	W
Other Industrial	1,969	2,510	2,253	2,044	1,648
Residential and Commercial	267	W	W	W	W
Total	27,524	30,990	34,449	34,517	34,704
Year-End Utility Stocks					
(thousand short tons)	9,948	6,864	7,612	5,881	5,415
Electricity Generation					
Total (million kilowatthours)	57,108	63,047	73,807	75,505	77,351
Coal (percent)	94	95	96	95	95
Nuclear (percent)	0	0	0	0	0
Other (percent)	6	5	4	5	5

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	24.39	23.24
Sulfur Content (percent by weight)	1.73	2.44
Ash Content (percent by weight)	9.81	11.60
Pounds of Sulfur per million Btu	1.42	2.10
Dollars per million Btu	1.47	1.16
Dollars per short ton	35.94	27.01

Kentucky

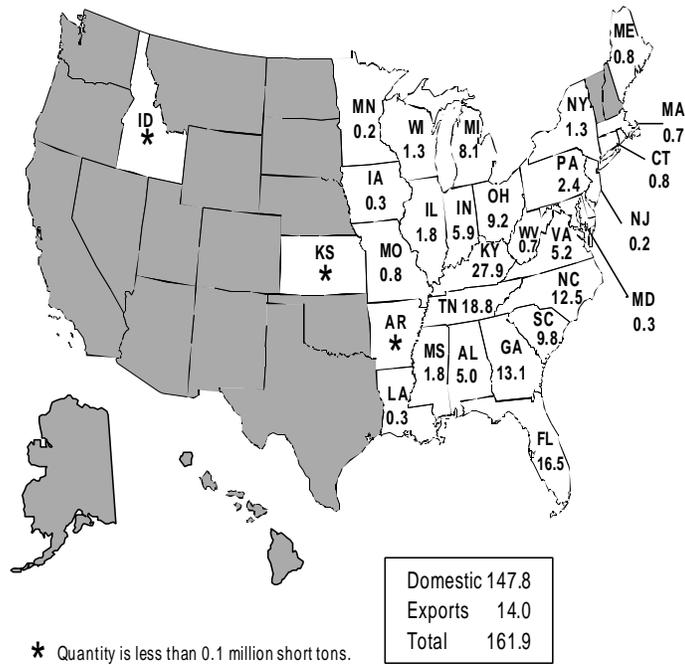
Estimated Total State Energy Consumption, 1991: 1,477 trillion Btu (coal, 805; natural gas, 196; petroleum, 508; nuclear electric power, 0; hydroelectric power, 38; other, 0; net interstate flow of electricity and associated losses, -71).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

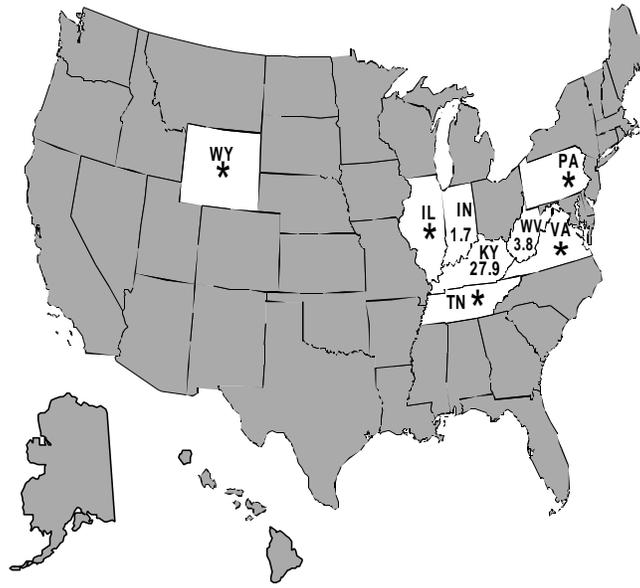
Destination of Coal Produced in Kentucky, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 58; water, 31; truck, 8; tramway/conveyor, 1; unknown, 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Kentucky, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	33.5
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Louisiana

Coal is a relatively new source of energy in Louisiana. Large amounts of coal from other States were first consumed in Louisiana in the early 1980's to generate electricity. Production and consumption of Louisiana's coal, all lignite, began in the mid-1980's. Although the annual output of lignite has risen to about 3 million short tons, its role in Louisiana's economy is greatly overshadowed by the large amounts of natural gas and crude oil produced in the State.

Lignite deposits of commercial importance occur in the northwestern part of Louisiana. Lignite was found in that area as early as 1812, nearly a century before petroleum was discovered in the State. In the early 1800's, small amounts of lignite dug from outcrops were used locally as fuel for blacksmithing and domestic heating. Around the turn of the century, lignite was used to heat a school near Mansfield. It was also tested as a locomotive fuel, but found unsuitable. Attempts to mine lignite underground were short-lived, due not only to a lack of markets, but also to the difficulty of mining under strata that had to be supported with extensive timbering. Interest in lignite faded in the early 1900's when the State's large oil and gas fields were developed.

Interest in Louisiana's lignite was renewed during World War II when the Nation assessed its mineral resources. The lignite could not compete as a fuel, but it had potential as raw material for making certain chemicals, dyes, fertilizers, and livestock feeds. A large amount of such products had been imported from Europe, particularly Germany. However, Louisiana's lignite was never used during the war.

In the 1950's and 1960's, lignite was recognized as a potential fuel for generating electricity in the State, and large reserves were delineated in the Dolet Hills area, near Mansfield, De Soto Parish. At the time, however, lignite was not cost-competitive. The economics changed in the late 1970's as pricing and legislation limited the use of natural gas as a power plant fuel. As a result, when the Central Louisiana Electric Company, Incorporated, and the Southwestern Electric Power Company evaluated their options to meet a growing demand for electricity,

they jointly agreed that a mine-mouth power plant, fueled with lignite, would be the most economical choice. The site selected for both a surface mine and a power plant was Dolet Hills.

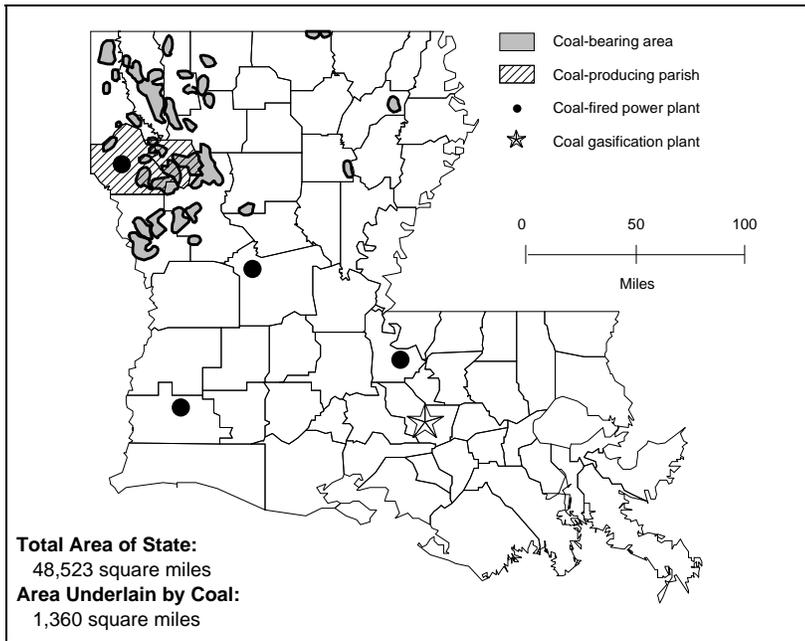
In 1985, the Dolet Hills mine, operated by Dolet Hills Mining Company, began supplying lignite to the power plant's stockpile by use of a 7.5-mile-long conveyor. The following year, the power plant began commercial operations with a generating capability of 650 megawatts. In late 1989, a second, smaller surface mine was opened in nearby Red River Parish to provide an additional source of lignite, delivered by truck to the power plant. In general, the lignite beds mined (part of the Wilcox Group) average 6 feet in thickness.

In 1992, Louisiana's lignite output climbed to a record of more than 3 million short tons. It accounted for about one-fourth of the 14 million short tons of coal consumed in the State. Wyoming was by far the principal source of coal consumed in Louisiana, nearly all used to generate electricity. The State's largest coal-burning power plant is the 1,620-megawatt Big Cajun 2, operated by Cajun Electric Power Cooperative, Inc., in Pointe Coupee Parish. The plant is fueled with Wyoming subbituminous coal. The industrial use of coal in Louisiana is largely centered at a coal gasification plant at Plaquemine. The plant, placed in service in 1987, is one of three U.S. coal gasification plants currently in commercial use. It is operated by Destec Energy, Incorporated, to supply electricity and superheated steam to an adjacent chemical complex of the Dow Chemical Company. The plant has a generating capacity of 160 megawatts and uses more than 2,000 short tons of coal per day, all low-sulfur subbituminous coal from Wyoming. A small amount of coal from Kentucky is also used in paperboard manufacturing.

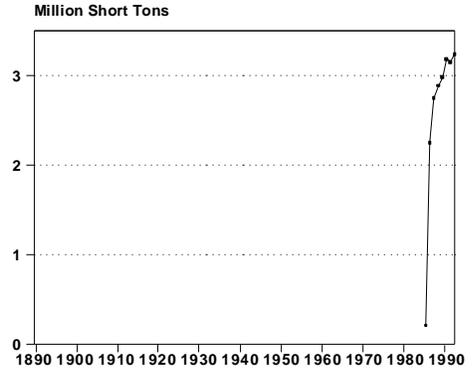
Large amounts of coal from other States are exported through the New Orleans Customs District, which includes the port areas of New Orleans and Baton Rouge on the lower Mississippi River. The coal is handled at terminals and also transloaded midstream from barges to ships. In 1992, about 13 million short tons of coal, mostly steam coal, were exported through the New Orleans

Customs District. This represented about 13 percent of total U.S. coal exports and ranked New Orleans as the third-largest coal-exporting district, following Norfolk, Virginia, and Cleveland, Ohio. Small amounts of coal for power plants in other southern States have also been imported through New Orleans.

Louisiana



Coal Production, 1890-1992



First Year of Documented Coal Production 1895 (207,000 short tons)
Peak Year of Coal Production 1992 (3,240,000 short tons)

Coal Reserves (million short tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	0	484	484
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	0	0
0.61-1.67 (medium sulfur)	0	359	359
> 1.67 (high sulfur)	0	0	0
Total	0	359	359
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	0	207	3,186	3,151	3,240
Mines	0	1	2	2	2
Miners	0	72	103	103	77
Productivity (short tons per miner per hour)	--	2.34	13.16	12.56	12.43
Average Mine Price (dollars per short ton)	--	W	W	W	W

Total

Louisiana

Quantity (thousand short tons)	0	207	3,186	3,151	3,240
Mines	0	1	2	2	2
Miners	0	72	103	103	77
Productivity (short tons per miner per hour)	--	2.34	13.16	12.56	12.43
Average Mine Price (dollars per short ton)	--	W	W	W	W

Louisiana

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	1	83	1	17	0	0	0	0
All Mines	1	83	1	17	0	0	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	0	8,760	11,748	12,406	13,025
Coke Plants	0	0	0	0	0
Other Industrial	107	W	W	W	W
Residential and Commercial	4	W	W	W	W
Total	111	9,217	12,547	12,965	13,622
Year-End Utility Stocks					
(thousand short tons)	0	1,978	2,458	2,235	1,701
Electricity Generation					
Total (million kilowatthours)	45,744	44,261	58,168	57,158	55,188
Coal (percent)	0	32	31	33	36
Nuclear (percent)	0	6	24	24	19
Other (percent)	100	62	45	43	45

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	13.90	16.24
Sulfur Content (percent by weight) .....	.62	.50
Ash Content (percent by weight)	12.14	7.20
Pounds of Sulfur per million Btu .....	.89	.62
Dollars per million Btu	1.38	1.54
Dollars per short ton	19.22	24.93

Louisiana

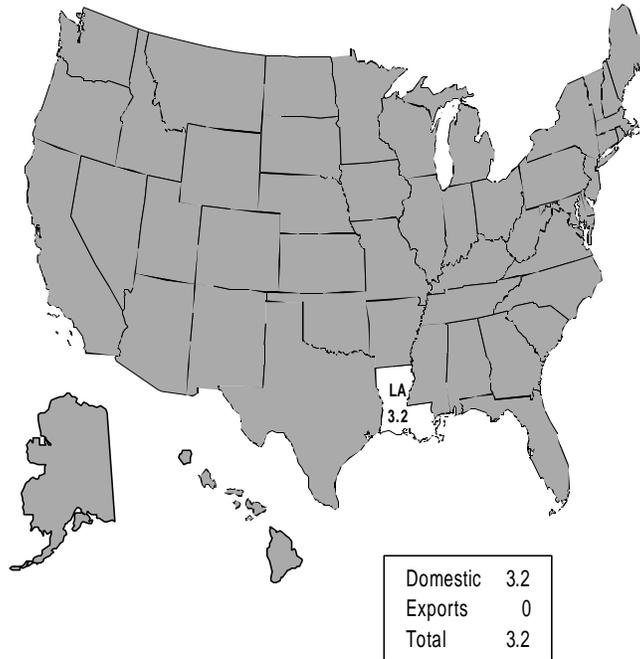
Estimated Total State Energy Consumption, 1991: 3,469 trillion Btu (coal, 214; natural gas, 1,579; petroleum, 1,445; nuclear electric power, 150; hydroelectric power, 0; other, 0; net interstate flow of electricity and associated losses, 81).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

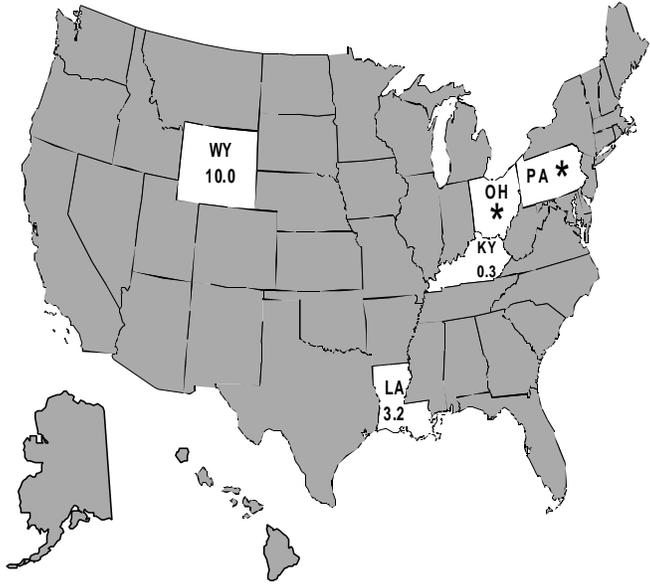
Destination of Coal Produced in Louisiana, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): truck, 17; tramway/conveyor, 83.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Louisiana, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	13.5
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Maryland

Coal is the principal mineral fuel produced in the State, which also has a small output of natural gas from a deposit in the coal mining area. In 1992, the coal produced was estimated to represent about one-fifth of the total value of Maryland's mineral production.

Maryland's coal deposits are located in two western counties, Allegany and Garrett. The coal, all bituminous in rank, occurs in five elongated fields on the Allegheny Plateau, which composes the eastern edge of the Appalachian Coal Basin in the State. The coalbeds are moderately inclined on the flanks of the fields, but are generally flat within the fields.

Production is largely from two adjoining fields, Georges Creek and Potomac. Although about 13 coalbeds were mined in 1992, nearly three-fourths of the total output was from the Upper Freeport coalbed. The beds mined range from 2 to 10 feet in thickness. In recent years, both steam and metallurgical coal have been produced, the latter for the export market.

Maryland's coal production began in the 1780's, when small amounts were mined for Fort Cumberland, a frontier outpost. In 1830, the first coal shipments eastward were made by barge down the Potomac River, a route later abandoned because of the rapids in the river. The State's first coal mining company was incorporated in 1836, but coal production did not become important until the Baltimore and Ohio Rail-road reached Cumberland in 1842. In 1850, the opening of the Chesapeake and Ohio Canal from Cumberland to Washington, D.C., provided another route for coal shipments. Over 21 million short tons of coal were transported on the canal before it closed in 1923.

Maryland's coal production rose above 1 million short tons in 1865, exceeded 4 million short tons by the turn of the century, and reached an all-time high of about 6 million short tons in 1907. A small amount of the coal produced in the early 1900's was a premium smithing (blacksmith) coal that was specially processed and delivered in box cars to customers throughout the Uni-
ted

States and in Canada. Coal production declined sharply after 1920, reflecting downturns in the economy, recurrent labor problems, and the extensive

replacement of coal by petroleum. Production fell below 1 million short tons during the 1950's and early 1960's before the trend turned upwards, due mostly to an increasing use of coal to generate electricity. Over 3 million short tons were produced in 1992.

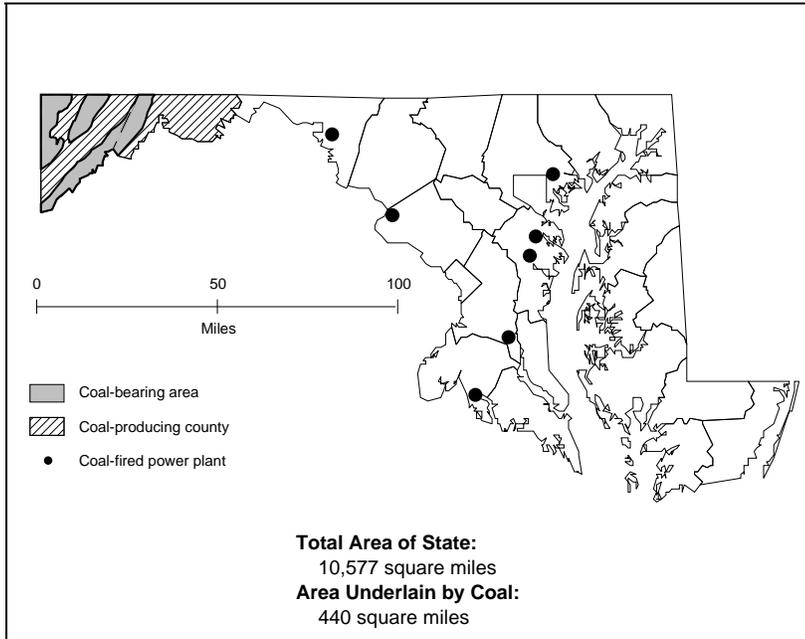
Before World War II, underground mines accounted for most of Maryland's coal production. A rising demand during the war and a shortage of manpower at underground mines led to an increase in surface coal mining. Surface mines predominated until the early 1980's, when underground production once again became the largest source of production, accounting for more than half of the total in recent years. The State's largest mine in 1992, producing more than 2 million short tons, was the Mettiki underground mine of Mapco Coal Inc., in Garrett County. Garrett County accounted for the bulk of the State's coal output in 1992.

Of the coal produced in 1992, more than 90 percent was for domestic markets and the rest was exported overseas. About 60 percent of domestic shipments were to electric power plants in West Virginia. Maryland's power plants received nearly all of the balance.

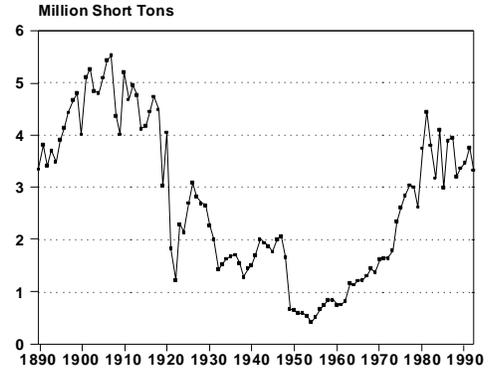
About 10 million short tons of coal were consumed in Maryland in 1992. Electric power plants were the major consumers, receiving about 10 percent of their requirements from mines in Maryland and most of the balance from West Virginia and Pennsylvania. Maryland's largest coal-generating facility is the 1,284-megawatt Brandon Shores plant of Baltimore Gas & Electric Company, in Anne Arundel County. Small amounts of coal were used by other consumers, chiefly cement plants and a paper mill. Until early 1992, a coke plant was in operation at the Sparrows Point Steel Plant of Bethlehem Steel Corporation, near Baltimore.

The Baltimore Customs District is an important East Coast coal-exporting region, handling metallurgical and steam coal produced in northern Appalachia. In 1992, it accounted for 15 percent of the coal exported from the East Coast and 9 percent of total U.S. coal exports. Export coal is handled at the Bayside Transshipping Facility and the CONSOL Coal Terminal.

Maryland



Coal Production, 1890-1992



First Year of Documented Coal Production 1820 (3,000 short tons)
Peak Year of Coal Production 1907 (5,533,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	664	86	750
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	29	3	32
0.61-1.67 (medium sulfur)	158	22	180
> 1.67 (high sulfur)	177	34	210
Total	364	58	422
Estimated Recoverable Reserves at Active Mines, Year-End 1992	W	W	59

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	1,494	1,785	1,985	2,631	2,270
Mines	4	6	1	2	3
Miners	561	375	288	309	228
Productivity (short tons per miner per hour)	1.48	2.48	3.17	3.73	3.50
Average Mine Price (dollars per short ton)	38.80	W	W	W	W
Surface					
Quantity (thousand short tons)	2,266	1,200	1,502	1,142	1,071
Mines	28	39	26	24	21
Miners	526	303	301	215	210
Productivity (short tons per miner per hour)	2.13	2.45	2.66	2.23	2.13
Average Mine Price (dollars per short ton)	20.82	W	W	W	W

Total

Maryland

Quantity (thousand short tons)	3,760	2,985	3,487	3,773	3,341
Mines	32	45	27	26	24
Miners	1,087	678	589	524	438
Productivity (short tons per miner per hour)	1.79	2.47	2.93	3.11	2.91
Average Mine Price (dollars per short ton)	28.47	27.40	25.97	25.73	25.39

Maryland

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	1	99	0	0	0	0	2	1
Surface	0	0	0	0	4	57	17	43
All Mines	1	68	0	0	4	18	19	14

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	5,908	7,046	8,945	8,632	9,001
Coke Plants	2,645	W	W	W	W
Other Industrial	723	718	945	1,040	718
Residential and Commercial	36	W	W	W	W
Total	9,312	10,013	11,193	10,709	9,733
Year-End Utility Stocks					
(thousand short tons)	1,376	1,636	2,114	2,220	2,400
Electricity Generation					
Total (million kilowatthours)	32,174	32,300	31,497	38,215	39,426
Coal (percent)	45	55	74	59	60
Nuclear (percent)	34	31	4	24	27
Other (percent)	21	14	22	17	13

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	25.13	25.51
Sulfur Content (percent by weight)	1.69	1.36
Ash Content (percent by weight)	12.94	10.47
Pounds of Sulfur per million Btu	1.35	1.07
Dollars per million Btu	1.38	1.60
Dollars per short ton	34.66	40.68

Maryland

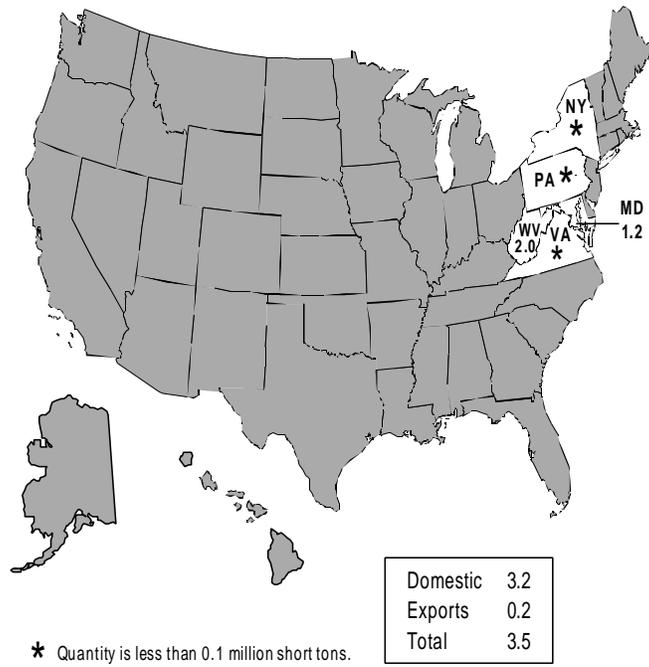
Estimated Total State Energy Consumption, 1991: 1,215 trillion Btu (coal, 275; natural gas, 178; petroleum, 495; nuclear electric power, 97; hydroelectric power, 15; other, 0; net interstate flow of electricity and associated losses, 156).

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

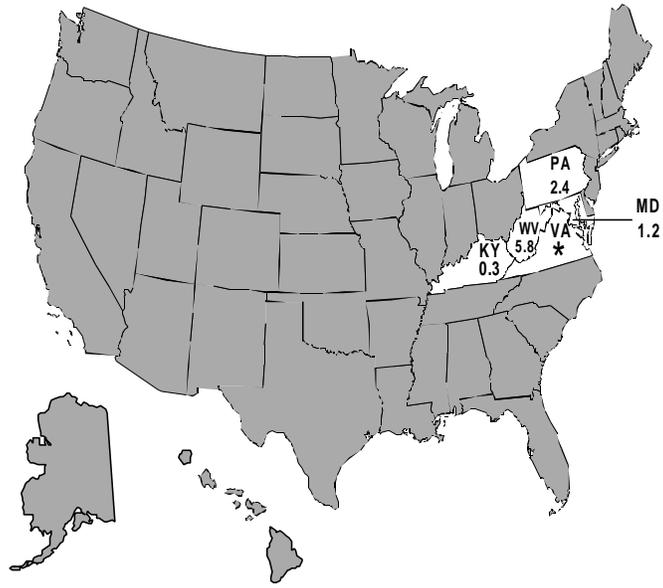
Destination of Coal Produced in Maryland, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 67; truck, 30; unknown, 3.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Maryland, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	9.7
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Missouri

Coal mining is a relatively small industry in Missouri, but coal is the principal mineral fuel produced. In 1992, the value of coal production accounted for an estimated 6 percent of the total value of all mineral commodities produced in the State, including oil and natural gas.

Missouri's coal deposits are in the northern and western parts of the State. The coal, all bituminous in rank, occurs in thin beds. The leading source of coal production from the six beds mined in 1992 was the Bevier coalbed, which averages 3 feet in thickness. Although Missouri's coal has high heat value (averaging about 22 million Btu per short ton), its high sulfur content (averaging about 4 percent by weight) has hindered its use. In addition, the thin coalbeds common in the State are often uneconomical to mine.

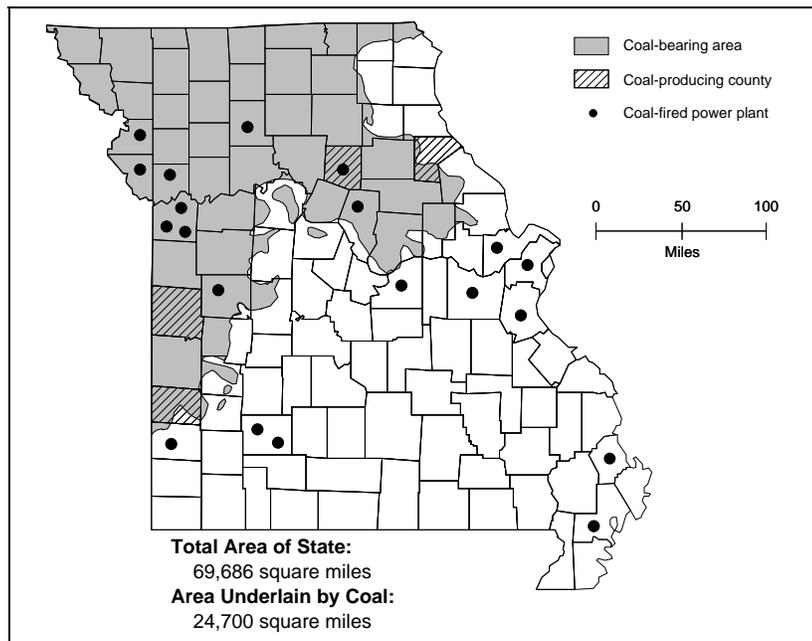
Missouri was the first State west of the Mississippi River to produce coal commercially. The occurrence of coal in Missouri appears to have been known as early as 1806, when it was noted on the banks of the Osage River, south of the present site of Prairie City in Bates County. By 1881, coal mining had become a thriving enterprise in the State, with the railroads the largest coal consumers. Production grew to more than 5 million short tons during World War I, and then declined slightly before rising during World War II. The postwar market for Missouri coal fell as coal-burning locomotives were replaced by diesel-electric engines, and the residential use of coal suffered from competition

from oil and natural gas. By the early 1970's, production was trending upward due to the increased use of coal to generate electricity, and in 1984 the coal output reached a record of nearly 7 million short tons. Since then production has fallen, reflecting competition from better quality coal from other States. Missouri's coal production was nearly 3 million short tons in 1992.

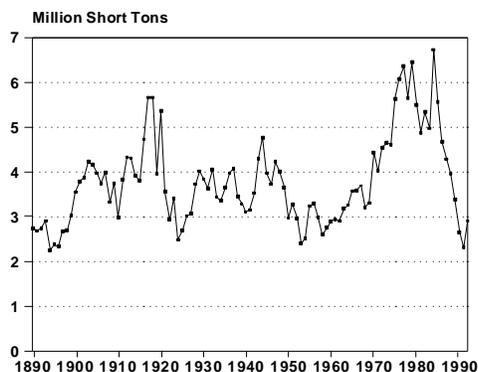
Most of the early coal mines in Missouri were underground operations. Surface mining began in the mid-1930's and since the late 1960's it has accounted for virtually all the coal produced in the State. The Thomas Hill surface mine of Associated Electric Coop Inc., in Randolph County, was the State's major coal producer in 1992. Randolph County was the source of nearly 90 percent of Missouri's coal output.

Nearly all of the coal produced in Missouri in 1992 was for consumers in the State. Of the 25 million short tons of coal consumed, however, only about 11 percent was from mines in the State. Electric utilities were by far the largest coal consumers. About half of the utility coal was from Illinois, about one-third was from Wyoming, and most of the balance was from Missouri. The largest coal-fired generating units, totaling 2,232 megawatts, are at the Labadie Power Plant of Union Electric Company, in Franklin County. Most of the coal consumed by other industries, mainly cement and lime plants, was from other States.

Missouri



Coal Production, 1890-1992



First Year of Documented Coal Production 1840 (9,972 short tons)
Peak Year of Coal Production 1984 (6,733,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	1,479	4,522	6,001
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	0	0
0.61-1.67 (medium sulfur)	0	0	0
> 1.67 (high sulfur)	689	3,166	3,855
Total	689	3,166	3,855
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	5	0	0	0
Mines	0	1	0	0	0
Miners	0	NA	0	0	0
Productivity (short tons per miner per hour)	--	NA	--	--	--
Average Mine Price (dollars per short ton)	--	NA	--	--	--
Surface					
Quantity (thousand short tons)	5,503	5,566	2,647	2,304	2,886
Mines	13	14	5	5	5
Miners	1,093	1,108	347	312	323
Productivity (short tons per miner per hour)	2.34	2.28	2.99	2.69	3.10
Average Mine Price (dollars per short ton)	20.50	27.08	W	W	W

Total

Missouri

Quantity (thousand short tons)	5,503	5,571	2,647	2,304	2,886
Mines	13	15	5	5	5
Miners	1,093	1,108	347	312	323
Productivity (short tons per miner per hour)	2.34	2.28	2.99	2.69	3.10
Average Mine Price (dollars per short ton)	20.50	27.08	W	W	W

Missouri

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	1	87	0	0	3	13	1	<1
All Mines	1	87	0	0	3	13	1	<1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	23,169	22,779	24,231	24,286	23,815
Coke Plants	W	W	W	0	0
Other Industrial	1,396	1,565	1,321	1,235	1,178
Residential and Commercial	W	W	W	252	228
Total	24,845	24,733	25,836	25,773	25,221
Year-End Utility Stocks					
(thousand short tons)	7,348	6,049	4,434	5,458	6,045
Electricity Generation					
Total (million kilowatthours)	48,930	57,335	59,011	60,121	56,627
Coal (percent)	96	80	82	80	83
Nuclear (percent)	0	14	14	17	14
Other (percent)	4	6	4	3	3

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	21.18	20.64
Sulfur Content (percent by weight)	4.15	1.80
Ash Content (percent by weight)	10.22	7.71
Pounds of Sulfur per million Btu	3.92	1.74
Dollars per million Btu	1.63	1.34
Dollars per short ton	34.43	27.57

Missouri

Estimated Total State Energy Consumption, 1991: 1,513 trillion Btu (coal, 535; natural gas, 259; petroleum, 622; nuclear electric power, 107; hydroelectric power, 11; other, 0; net interstate flow of electricity and associated losses, -21).

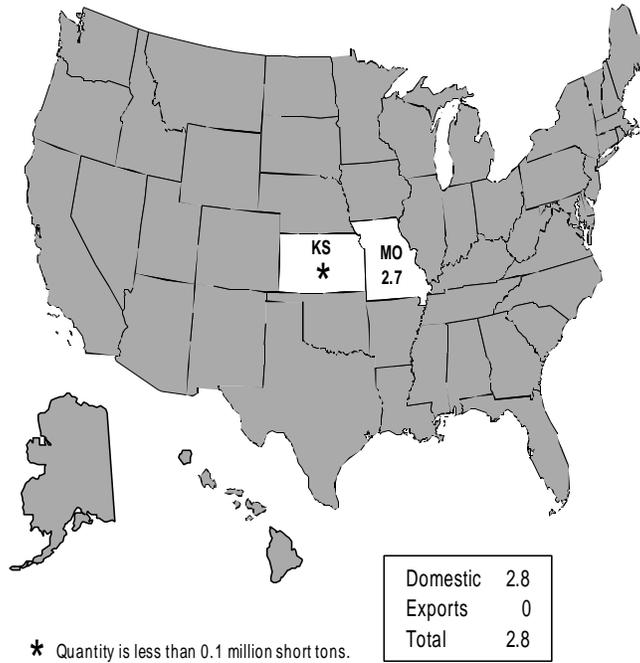
W = Withheld to avoid disclosure of individual company data.

NA = Not available.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

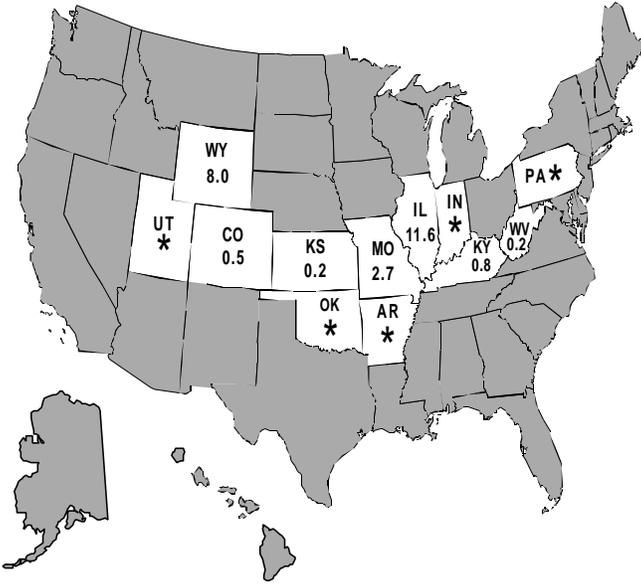
Destination of Coal Produced in Missouri, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 3; truck, 10; tramway/conveyor, 86; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Missouri, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	24.2
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Montana

Coal was estimated to be the leading mineral commodity produced in Montana in 1992. It accounted for more than one-fourth of the estimated total value of all minerals produced, ranking slightly higher than crude oil. Royalties from Federal coal leases generated \$34 million, which was disbursed equally to the State and the Federal Government. Royalties from a coal lease granted by the Crow Tribe were over \$1 million.

Coal deposits are widely distributed across Montana, together comprising the Nation's largest coal reserve base. The ranks of coal include lignite, subbituminous, and bituminous. Production, however, is nearly all low-sulfur subbituminous coal, with a small amount of lignite. The major source of subbituminous coal, accounting for about half of the State's production, is the Rosebud coalbed. This coalbed, which ranges up to 30 feet in thickness, is in the Powder River Basin, located in the southeastern part of the State.

Coal was reportedly first used in Montana in 1807, by a Spanish fur trader who used to heat his outpost. Montana's coal industry began on a small scale in 1880, and by 1900 it was well established. The bulk of production was for railroad fuel. Lesser amounts were for heating and to produce coke for smelting. Production rose to nearly 5 million short tons in 1918. It then declined to an average of about 3 million short tons annually, rising slightly during World War II. The relative stability of Montana's coal output during those three decades reflects the small level of industrial development in the State, the development of its hydroelectric and petroleum resources, and competition with coal from other States and with other fuels.

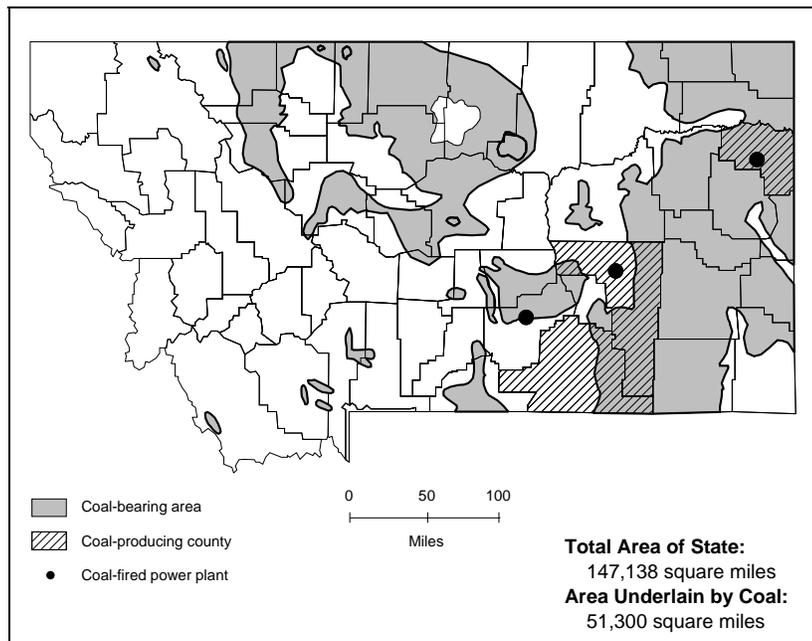
In the 1950's and 1960's, Montana's coal production fell sharply due to the replacement of coal-fired locomotives by diesel-electric locomotives and an abundant supply of natural gas. The 1970's brought about a significant increase in production due largely to the construction of the large Colstrip coal-fired power plant

in Rosebud County. Over the next decade, coal production continued to rise as the plant added generating units. Additional demand for Montana's low-sulfur coal by utilities in other States was spurred by the enactment of Federal regulations on emissions. In 1992, Montana's coal output reached a record of 39 million short tons.

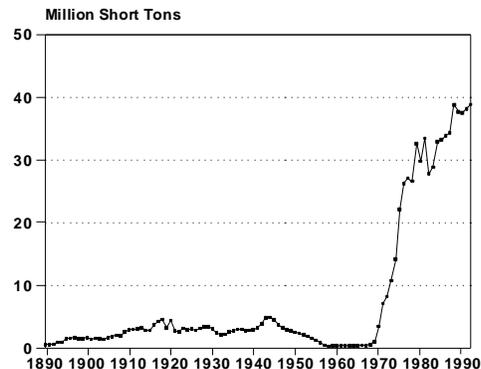
Early coal production in Montana was mostly from underground mines. Large-scale surface mining began in the 1920's at Colstrip, Rosebud County, where the Rosebud seam was covered by 20 to 50 feet of overburden. By 1930, the Colstrip mine accounted for more than one-third of the State's coal output. For about the past two decades, virtually all of Montana's coal has been produced by surface mining. The largest mine in 1992 was the Rosebud mine of Western Energy Company, in Rosebud County. Its output of more than 14 million short tons ranked it as the fifth-largest U.S. coal mine. The State's only lignite producer is the Savage Strip Mine of Knife River Coal Company, in Richland County. Nearly all of Montana's coal production is from Big Horn and Rosebud counties. In 1992, more than 60 percent of the State's production was from Federal coal leases, about 6 percent was from Crow Indian leases, with the balance from State and private lands.

More than two-thirds of Montana's 1992 coal output was shipped out of State, including a small amount for overseas customers. The major destinations were electric utilities in Michigan and Minnesota. The 11 million short tons of coal consumed in Montana in 1992 was nearly all for generating electricity, and all of the utility coal used was produced in the State. Montana's largest coal-fired generating units, totaling 2,060 megawatts, are at the Colstrip plant of Montana Power Company, in Rosebud County. A small amount of coal was also used in the State for processing sugar cane and manufacturing cement.

Montana



Coal Production, 1890-1992



First Year of Documented Coal Production 1880 (224 short tons)
Peak Year of Coal Production 1992 (38,889,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	70,959	48,960	119,919
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	25,397	25,099	50,496
0.61-1.67 (medium sulfur)	9,648	11,970	21,618
> 1.67 (high sulfur)	878	2,517	3,395
Total	35,923	39,585	75,508
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	1,352	1,352

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	3	10
Mines	0	0	0	1	1
Miners	0	0	0	NA	NA
Productivity (short tons per miner per hour)	--	--	--	NA	NA
Average Mine Price (dollars per short ton)	--	--	--	NA	NA
Surface					
Quantity (thousand short tons)	29,872	33,290	37,616	38,235	38,879
Mines	9	9	9	8	7
Miners	1,131	1,173	821	794	715
Productivity (short tons per miner per hour)	11.98	14.73	18.78	18.99	20.16
Average Mine Price (dollars per short ton)	10.50	13.18	9.42	10.76	10.20
Total					
Quantity (thousand short tons)	29,872	33,290	37,616	38,237	38,889
Mines	9	9	9	9	8

Montana

Miners	1,131	1,173	821	794	715
Productivity (short tons per miner per hour)	11.98	14.73	18.78	18.99	20.16
Average Mine Price (dollars per short ton)	10.50	13.18	9.42	10.76	10.20

Montana

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	1	100
Surface	6	99	0	0	1	1	0	0
All Mines	6	99	0	0	1	1	1	<1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	3,351	5,480	9,399	10,223	10,768
Coke Plants	0	0	0	0	0
Other Industrial	154	W	W	W	W
Residential and Commercial	14	W	W	W	W
Total	3,519	5,713	9,676	10,549	11,040
Year-End Utility Stocks (thousand short tons)					
	416	634	767	741	735
Electricity Generation					
Total (million kilowatthours)	15,496	18,773	25,719	28,157	25,468
Coal (percent)	33	45	58	57	67
Nuclear (percent)	0	0	0	0	0
Other (percent)	67	55	42	43	33

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	18.10	17.15
Sulfur Content (percent by weight) .....	.52	.66
Ash Content (percent by weight)	6.62	8.92
Pounds of Sulfur per million Btu .....	.57	.77
Dollars per million Btu	1.33	.71
Dollars per short ton	24.12	12.14

Montana

Estimated Total State Energy Consumption, 1991: 342 trillion Btu (coal, 180; natural gas, 47; petroleum, 145; nuclear electric power, 0; hydroelectric power, 124; other, 1; net interstate flow of electricity and associated losses, -154).

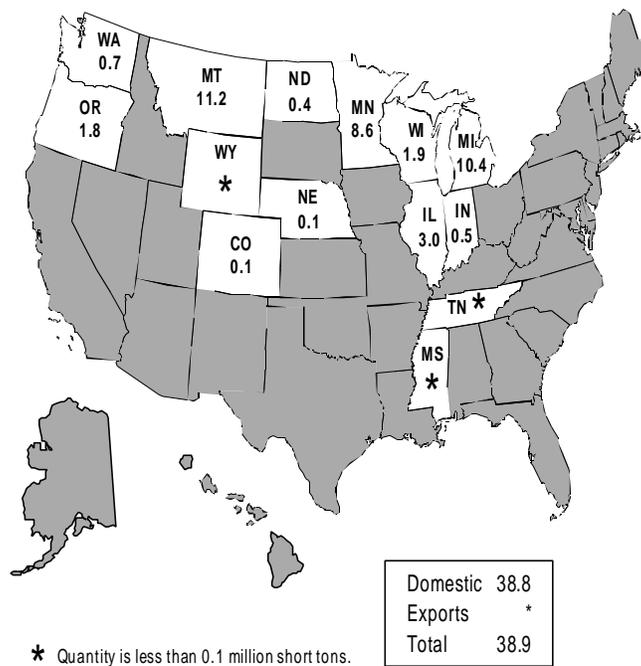
W = Withheld to avoid disclosure of individual company data.

NA = Not available.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Montana, 1992
(Million Short Tons)

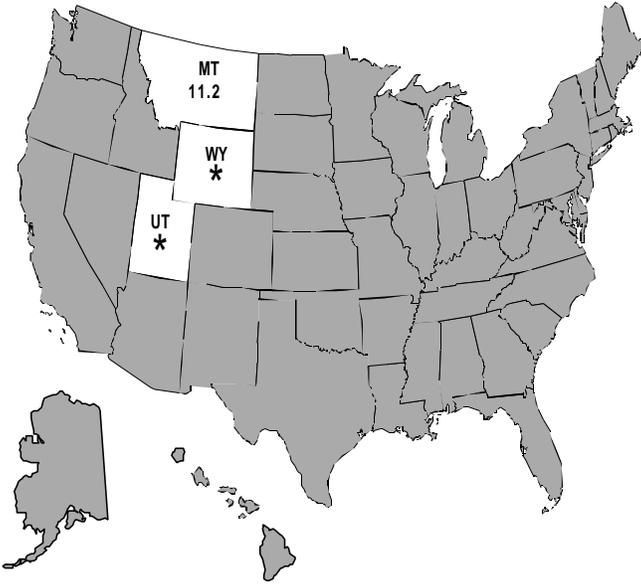


Transportation modes, domestic markets (percent): rail, 57; water, 16; truck, < 1; tramway/conveyor, 26; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Montana, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	11.2
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: New Mexico

Coal is one of four mineral fuels produced in New Mexico. In 1992, New Mexico's coal output was estimated to account for around 10 percent of the total value of all mineral commodities produced in the State. Crude oil and natural gas were by far the leading mineral commodities; the value of uranium production was small. Royalties from Indian and Federal coal leases totaled about \$32 million and \$14 million, respectively. Federal royalties were disbursed equally to the State and the Federal Government.

The principal coal-bearing areas in New Mexico are the San Juan and Raton basins, both in the northern part of the State. The San Juan Basin, the larger of the two, is the major source of coal production. San Juan Basin coal, which has a low sulfur content, ranges in rank from subbituminous in the South to bituminous in the North. About 18 coalbeds were mined in 1992, but most production was largely from the Fruitland Formation, which contains several coalbeds. The beds mined are generally 4 to 13 feet thick. The Raton Basin contains low-sulfur bituminous coal, including some that can be used to produce metallurgical coke. Coking coal was mined in the Raton Basin until 1986 and shipped primarily to a coke plant in California. The minable beds in the Raton Basin average over 5 feet in thickness.

Small amounts of the coal in New Mexico reportedly were used several centuries ago by Spanish explorers, and in the 1860's by the U.S. Army at Fort Craig, near present-day Socorro. The first commercial coal production was to supply fuel for railroads, metallic ore smelters, domestic and commercial heating, and small power plants. Until the 1920's, some coal was converted into coke in beehive ovens, principally for use in smelting copper. Around the same time, some coal from the Raton field was used to manufacture coal gas.

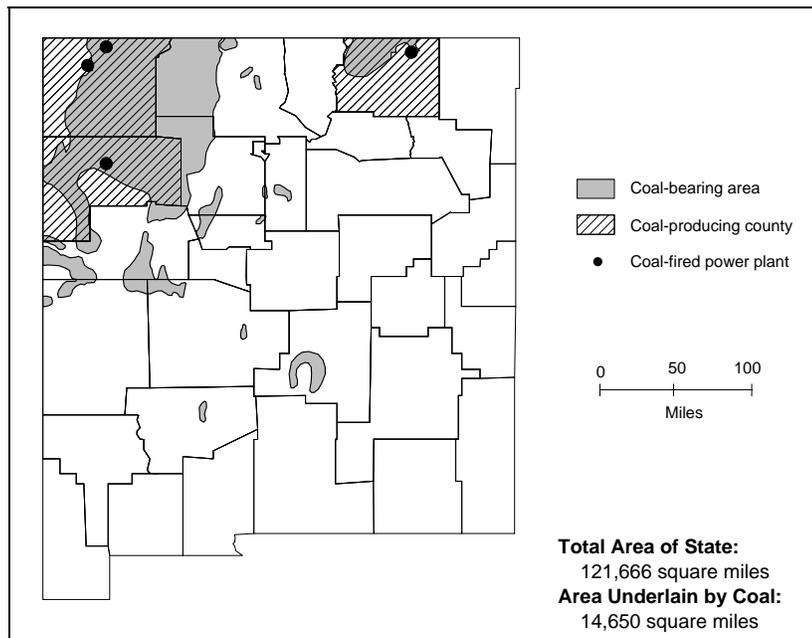
New Mexico's coal output rose to about 4 million short tons in 1918 and then slackened as many mines closed,

due chiefly to competition from natural gas and crude oil produced in New Mexico and in neighboring States. Over the next 40 years, production trended downward, eventually falling below 1 million short tons in the 1950's and early 1960's. In the late 1960's the State's coal industry was re-established with the opening of large mines to supply fuel for new coal-burning power plants built in New Mexico and Arizona to meet the growing demand for electricity in the Southwest. Rising almost steadily, New Mexico's coal production reached an all-time high of 25 million short tons in 1992.

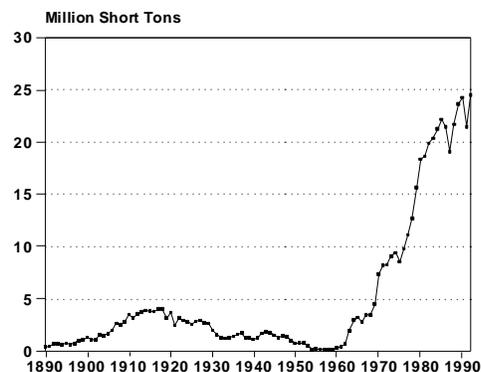
Underground mines were the chief source of coal production in New Mexico until the mid-1960's, when large surface mines were opened. Virtually all production in recent years has been from surface mines. The State's largest coal mine in 1992, with an output of about 9 million short tons, was the Navajo surface mine of BHP Minerals International Incorporated, in San Juan County. The mine produces from leases on Navajo land. Of the total coal produced in New Mexico in 1992, a little more than half was from Indian coal leases and about 15 percent was from Federal coal leases, with the balance from State and private lands. San Juan and McKinley counties were the source of nearly all of New Mexico's coal output.

Coal is produced in New Mexico mainly for electric utilities. In 1992, about 60 percent was for power plants in the State, and most of the balance was shipped to Arizona. Virtually all of the 15 million short tons of coal consumed in New Mexico was for generating electricity. The State's largest coal-fired power plant is the 2,040-megawatt Four Corners plant, operated by Arizona Public Service in San Juan County. The plant receives coal from the Navajo surface mine, about 12 miles away. A small amount of coal was also used at a cement plant in the State.

New Mexico



Coal Production, 1890-1992



First Year of Documented Coal Production 1882 (157,000 short tons)
Peak Year of Coal Production 1992 (24,549,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	2,122	2,308	4,430
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	565	236	802
0.61-1.67 (medium sulfur)	445	1,185	1,630
> 1.67 (high sulfur)	64	0	64
Total	1,074	1,421	2,496
Estimated Recoverable Reserves at Active Mines, Year-End 1992	W	W	1,495

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	950	803	76	25	93
Mines	1	2	1	1	1
Miners	390	249	10	63	141
Productivity (short tons per miner per hour)	1.34	1.64	4.27	.71	.40
Average Mine Price (dollars per short ton)	W	W	W	W	W
Surface					
Quantity (thousand short tons)	17,475	21,399	24,217	21,492	24,456
Mines	9	10	6	6	6
Miners	1,213	1,680	1,462	1,587	1,542
Productivity (short tons per miner per hour)	6.20	5.95	7.66	6.31	7.11
Average Mine Price (dollars per short ton)	W	W	W	W	W

Total

New Mexico

Quantity (thousand short tons)	18,425	22,203	24,292	21,518	24,549
Mines	10	12	7	7	7
Miners	1,603	1,929	1,472	1,650	1,683
Productivity (short tons per miner per hour)	5.30	5.43	7.64	6.25	6.68
Average Mine Price (dollars per short ton)	14.01	23.41	22.43	23.25	23.14

New Mexico

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	1	100
Surface	5	97	1	3	0	0	0	0
All Mines	5	97	1	3	0	0	1	<1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	11,406	14,498	15,065	12,809	14,775
Coke Plants	0	0	0	0	0
Other Industrial	W	W	W	W	W
Residential and Commercial	W	W	W	W	W
Total	11,458	14,589	15,111	12,858	14,832
Year-End Utility Stocks (thousand short tons)					
	1,429	1,434	1,538	1,399	1,570
Electricity Generation					
Total (million kilowatthours)	24,677	27,108	28,491	25,065	27,708
Coal (percent)	78	89	91	88	92
Nuclear (percent)	0	0	0	0	0
Other (percent)	22	11	9	12	8

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	18.65	18.03
Sulfur Content (percent by weight) .....	.69	.81
Ash Content (percent by weight)	19.49	22.49
Pounds of Sulfur per million Btu .....	.74	.90
Dollars per million Btu	1.46	1.32
Dollars per short ton	27.29	23.83

New Mexico

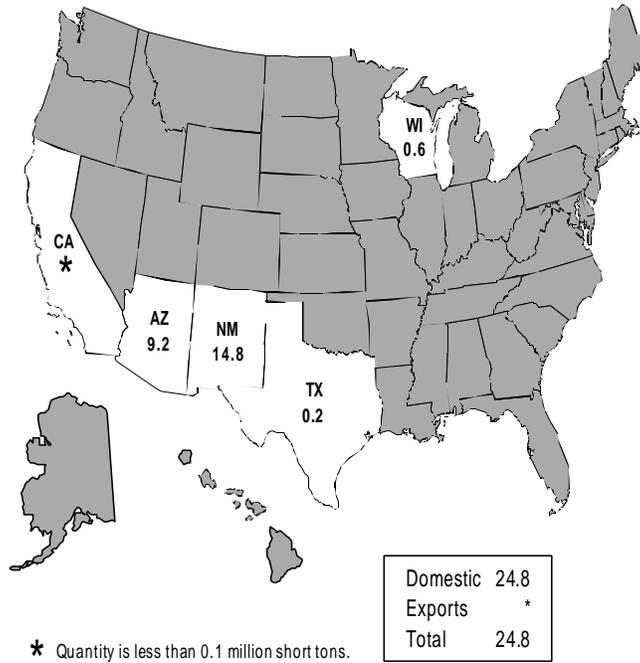
Estimated Total State Energy Consumption, 1991: 588 trillion Btu (coal, 234; natural gas, 227; petroleum, 236; nuclear electric power, 0; hydroelectric power, 3; other, 0; net interstate flow of electricity and associated losses, -112).

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

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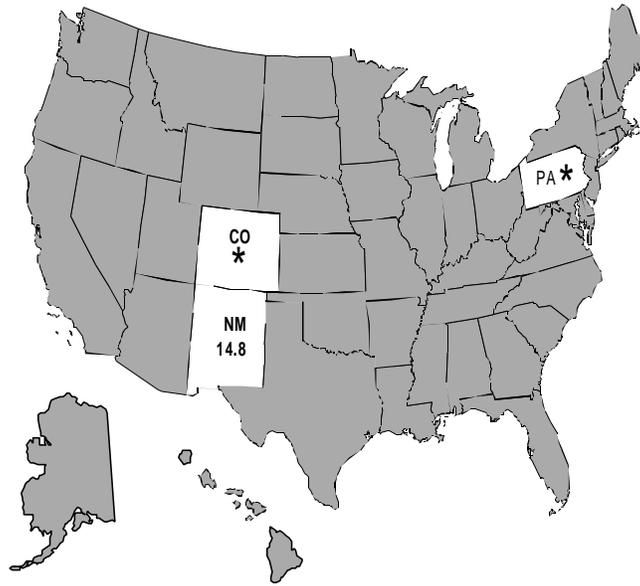
Destination of Coal Produced in New Mexico, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 44; truck, < 1; tramway/conveyor, 56; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in New Mexico, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	14.9
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: North Dakota

Lignite is the only rank of coal present in North Dakota. The value of lignite produced in 1992 represented more than 20 percent of the total value of all mineral commodities produced in the State and ranked second to crude oil. Lignite output from Federal leases generated about \$3 million in royalties, disbursed to the State and the Federal Government.

Lignite deposits underlie most of the western half of North Dakota. They occur in the Williston Basin, a large depression that also extends into the adjacent States and Canada. About four lignite beds were mined in 1992, the most important of which was the Beulah-Zapp. This bed, which averages 14 feet in thickness, was the source for most of the State's coal output.

The first recorded use of lignite in what is now North Dakota was in 1804, when the Lewis and Clark expedition burned it in a blacksmith forge. The presence of lignite, which could be used as a fuel in the generally treeless plains of North Dakota, was one of the promotional points made by land developers, territorial officials, and railroad companies to attract settlers to the area. Commercial production began in Morton County in the early 1870's. Production was stimulated in 1896 when State institutions were required by law to obtain as much of their fuel supply as possible from North Dakota mines.

Annual lignite production exceeded 1 million short tons in 1922, rose above 2 million short tons in the late 1930's, and generally remained at that level into the early 1960's. That long period of stagnation was due largely to competition from oil and gas (some produced in the State) and to the development of hydroelectric power from the Missouri River. Production turned upward in the late 1960's chiefly to supply fuel for new electric generation plants built in the State. North Dakota was the leading lignite-producing State from about 1920 through 1974, when Texas gained first place. North Dakota's lignite production reached a record 32

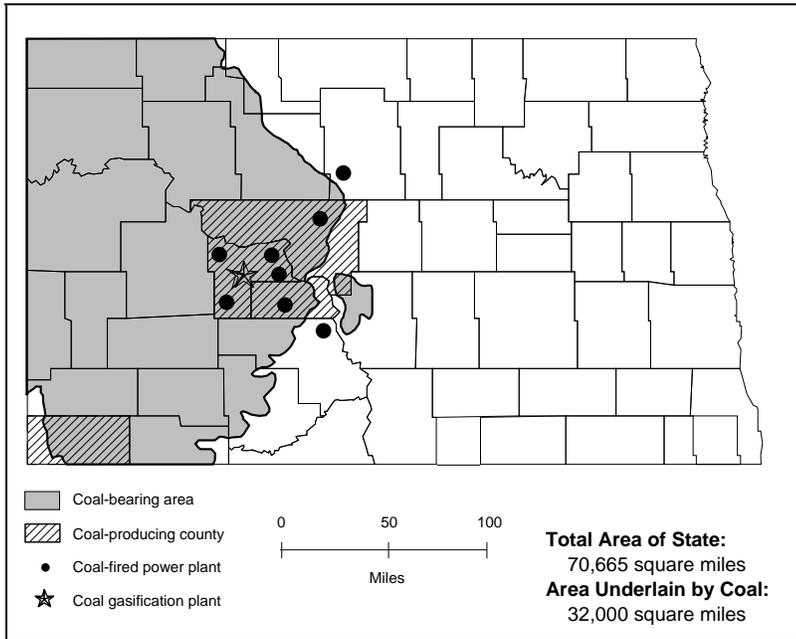
million short tons in 1992. About 20 percent of the production was from Federal leases.

Most of the early lignite production was from underground mines. Exposed beds were usually first surface-mined with horse-drawn scrapers and hand implements, and then the bed was followed underground. Surface mining with a steam shovel began in 1919. As technology advanced, North Dakota became one of the first States to use surface mining on a large scale. Surface mines accounted for more than half of the State's coal output by the mid 1930's and for all production since 1966. The largest coal mine in 1992, with an output of nearly 14 million short tons, was the Freedom-Coteau mine, operated by Coteau Properties Company. The mine is in Mercer County, the source of nearly half of the State's coal output.

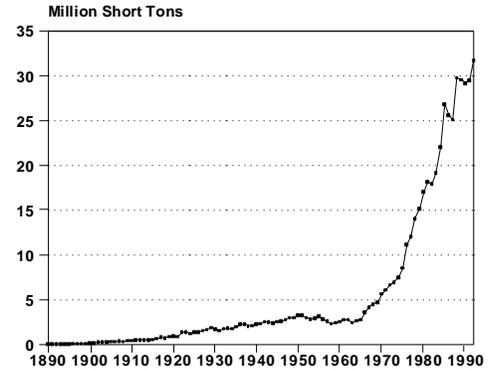
Nearly all of the lignite produced in North Dakota is consumed in the State. Electric power plants were the principal consumers of the 30 million short tons used in 1992. The largest coal-fired generating facility is the 931-megawatt Coal Creek plant of Cooperative Power Association, McLean County. Consumption in the industrial sector is dominated by the Great Plains Synfuels Plant, the largest of the Nation's three coal gasification plants. This plant, located near Beulah and operated by Dakota Gasification Company, manufactures a high-Btu synthetic natural gas. It converts an average of 16,000 short tons of lignite per day into 142 million cubic feet of pipeline-quality gas and byproducts such as anhydrous ammonia, sulfur, and liquid nitrogen.

A small amount of coal from other States, chiefly subbituminous coal from Montana, is also used in refining sugar. Small quantities of lignite have been made into cooking briquettes. Oxidized lignite, or Leonardite, has been used as a thinner for oil well drilling mud, as an industrial water softener, and as a soil conditioner.

North Dakota



Coal Production, 1890-1992



First Year of Documented Coal
Production 1884 (35,000 short tons)
Peak Year of Coal
Production 1992 (31,744,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base:			
(January 1, 1992)	0	9,590	9,590
Estimated Recoverable Reserves:			
(January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	1,201	1,201
0.61-1.67 (medium sulfur)	0	4,874	4,874
> 1.67 (high sulfur)	0	1,242	1,242
Total	0	7,316	7,316
Estimated Recoverable Reserves			
at Active Mines, Year-End 1992	0	1,335	1,335

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	16,975	26,873	29,213	29,530	31,744
Mines	13	14	11	8	8
Miners	1,711	1,132	931	814	744
Productivity (short tons per miner per hour)	8.97	11.40	16.12	17.64	18.12
Average Mine Price (dollars per short ton)	7.48	9.30	7.67	7.84	7.48

North Dakota

Total

Quantity (thousand short tons)	16,975	26,873	29,213	29,530	31,744
Mines	13	14	11	8	8
Miners	1,711	1,132	931	814	744
Productivity (short tons per miner per hour)	8.97	11.40	16.12	17.64	18.12
Average Mine Price (dollars per short ton)	7.48	9.30	7.67	7.84	7.48

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	7	99	0	0	1	1	0	0
All Mines	7	99	0	0	1	1	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	11,619	17,354	21,579	22,174	23,192
Coke Plants	0	0	0	0	0
Other Industrial	W	W	W	W	W
Residential and Commercial	W	W	W	W	W
Total	12,347	22,958	28,114	28,597	30,319
Year-End Utility Stocks					
(thousand short tons)	5,149	3,137	2,828	1,999	2,194
Electricity Generation					
Total (million kilowatthours)	15,829	22,071	26,824	27,535	28,592
Coal (percent)	84	90	94	94	94
Nuclear (percent)	0	0	0	0	0
Other (percent)	16	10	6	6	6

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	13.03	13.12
Sulfur Content (percent by weight) .....	.87	.87
Ash Content (percent by weight)	9.30	9.29
Pounds of Sulfur per million Btu	1.34	1.33
Dollars per million Btu .....	.75	.72
Dollars per short ton	9.81	9.45

North Dakota

Estimated Total State Energy Consumption, 1991: 320 trillion Btu (coal, 379; natural gas, 42; petroleum, 114; nuclear electric power, 0; hydroelectric power, 23; other, 0; net interstate flow of electricity and associated losses, -238).

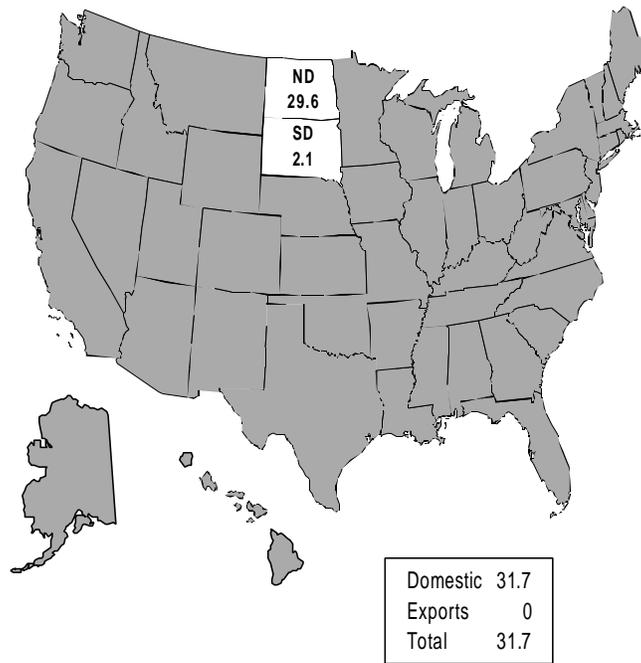
W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in North Dakota, 1992

(Million Short Tons)

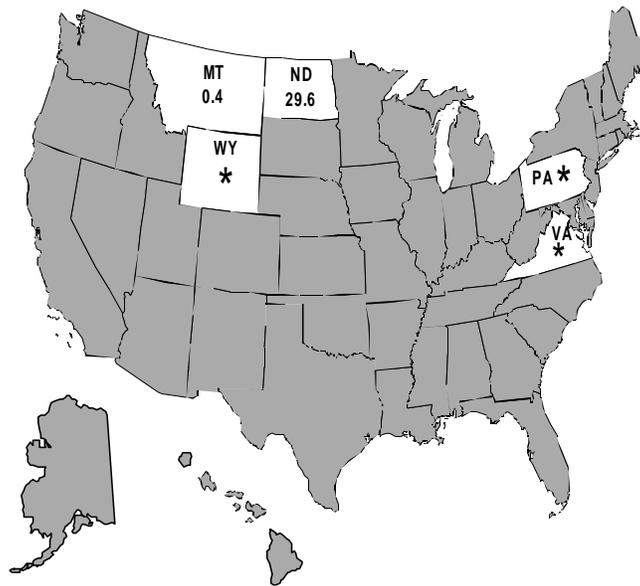


Transportation modes, domestic markets (percent): rail, 9; truck, 14; tramway/conveyor, 77; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in North Dakota, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	30.0
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Ohio

Coal is the most valuable mineral commodity in Ohio. Coal production in 1992 was estimated to account for about 40 percent of the total value of all mineral commodities produced in the State, including crude oil and natural gas.

The coal reserves of Ohio are part of the Appalachian coal basin and consist entirely of bituminous coal. The deposits underlie the eastern part of the State. As mined, the coal has a heat value ranging from 22 to 25 million Btu per short ton, but its use has been hampered by a high sulfur content, averaging more than 3 percent by weight. About 20 coalbeds were mined in 1992, but more than half of the output was from the Pittsburgh, Sewickley/Meigs, and Clarion coalbeds.

Coal production in Ohio began in the 1800's. Its early use expanded from domestic heating to blacksmithing, brickmaking, and evaporating brine in the salt industry. In 1827, flatboats carried the first shipments of coal to Cleveland via the Ohio-Erie Canal for use in steamboats. As early as 1835, coal was shipped down the Ohio and Mississippi Rivers for use in sugar refineries in New Orleans. By 1875, when more markets were opened due to the canal systems and railroad expansions across the State, Ohio's coal output rose to more than 5 million short tons. The presence of coal suitable for use in blast furnaces plus the occurrence of iron ore and limestone spurred the development of the coal industry and the iron and steel industry in the State.

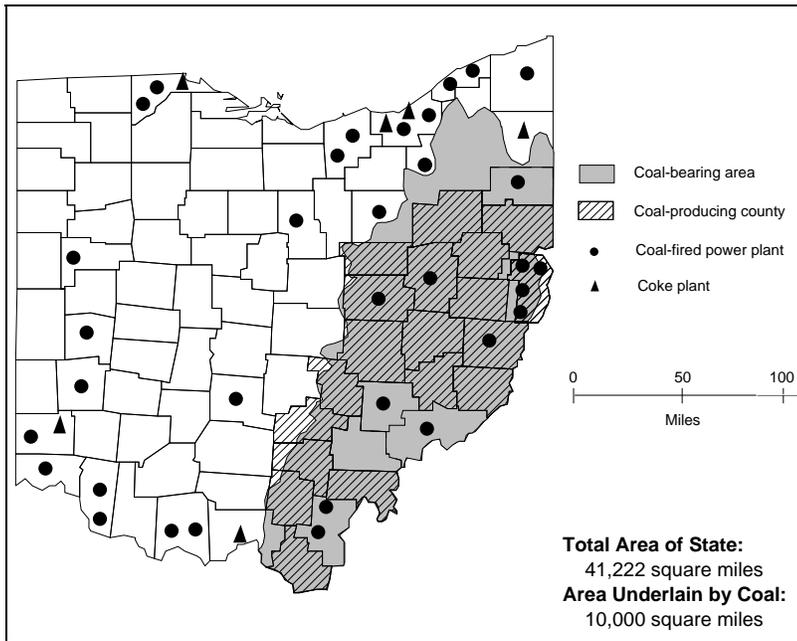
By the end of World War I in 1918, coal production reached 46 million short tons. Subsequent production declined, due partly to the Depression and partly to the greater use of oil and natural gas. World War II gave an impetus to the State's coal industry, and production gradually rose to an all-time high of 55 million short tons in 1970. Since then, the demand for Ohio's coal, which is handicapped by a high sulfur content, has been adversely affected by the enactment of clean air legislation and production has trended downward. Production was 30 million short tons in 1992.

Underground mining was the chief source of Ohio's coal production until World War II. Surface mining, which began in Ohio in 1915, now accounts for more than half of the State's coal production. However, the largest coal mine in Ohio in 1992, producing more than 3 million short tons, was the Powhatan No. 6 underground mine of the Ohio Valley Coal Company, in Belmont County. The State's leading coal-producing counties were Belmont and Meigs.

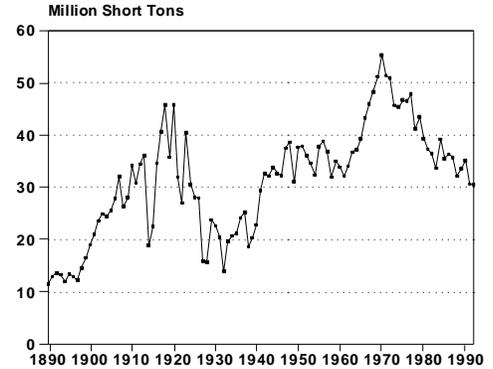
About 90 percent of the coal shipped from Ohio's mines in 1992 was delivered to consumers in the State, mainly electric utilities. A small amount was exported. Ohio coal represented nearly half of the total coal shipments to consumers in the State, with most of the balance from West Virginia and Kentucky. In 1992, Ohio was the third-largest coal-consuming State, following Texas and Indiana. Electric utilities were by far the largest market for the 59 million short tons of coal consumed in Ohio. About half of the utility coal used was produced in the State; the balance was mostly from West Virginia and Kentucky. In 1992, Ohio's power plants led the Nation in the amount of electricity generated from coal. Ohio's largest coal-fired electric utility is the 2,600-megawatt General James M. Gavin plant of Ohio Power Company, in Gallia County. More than half of the coal for Ohio's coke plants was from West Virginia, and the rest was from Kentucky and Virginia. Foremost among the many other industrial coal consumers in Ohio were paper mills and manufacturers of electrometallurgical products and industrial organic chemicals. More than 40 percent of this coal was from Ohio, with the balance mostly from Kentucky.

The Cleveland Customs District was the third-largest coal-exporting district in 1992, handling 10 million short tons, or 10 percent of the Nation's coal exports. Coal terminals are at Ashtabula, Conneaut, Sandusky, and Toledo. Most of the coal shipments from these terminals are to Canada.

Ohio



Coal Production, 1890-1992



First Year of Documented Coal Production 1838 (119,952 short tons)
Peak Year of Coal Production 1970 (55,351,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	17,919	5,973	23,892
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	135	118	253
0.61-1.67 (medium sulfur)	804	590	1,394
> 1.67 (high sulfur)	6,944	3,203	10,147
Total	7,883	3,910	11,794
Estimated Recoverable Reserves at Active Mines, Year-End 1992	316	260	576

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	12,994	13,646	12,920	12,237	12,031
Mines	19	14	13	12	10
Miners	7,843	4,166	2,603	2,359	1,926
Productivity (short tons per miner per hour) .....	.93	1.66	2.34	2.55	3.01
Average Mine Price (dollars per short ton)	38.42	41.75	33.93	31.52	30.11
Surface					
Quantity (thousand short tons)	26,400	21,956	22,332	18,333	18,371
Mines	180	190	159	147	139
Miners	6,795	4,788	3,263	2,934	2,589
Productivity (short tons per miner per hour)	2.03	2.34	3.17	2.76	3.06
Average Mine Price (dollars per short ton)	22.60	29.11	25.57	25.22	24.84

Total

Ohio

Quantity (thousand short tons)	39,394	35,602	35,252	30,569	30,403
Mines	199	204	172	159	149
Miners	14,638	8,954	5,866	5,293	4,515
Productivity (short tons per miner per hour)	1.46	2.02	2.80	2.67	3.04
Average Mine Price (dollars per short ton)	27.82	33.97	28.65	27.75	26.93

Ohio

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	4	84	1	7	4	8	1	1
Surface	2	19	7	29	32	36	98	16
All Mines	6	44	8	20	36	25	99	11

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	48,537	46,700	48,848	49,577	50,358
Coke Plants	10,268	5,242	4,949	3,698	3,755
Other Industrial	5,553	5,178	4,753	4,813	3,998
Residential and Commercial	556	859	654	489	588
Total	64,914	57,979	59,205	58,578	58,699
Year-End Utility Stocks (thousand short tons)					
	13,709	8,976	9,956	10,213	10,395
Electricity Generation					
Total (million kilowatthours)	110,247	110,763	126,510	132,694	136,296
Coal (percent)	97	98	91	88	88
Nuclear (percent)	2	2	8	11	11
Other (percent)	1	>1	1	1	1

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	23.70	23.97
Sulfur Content (percent by weight)	3.42	2.57
Ash Content (percent by weight)	10.98	11.24
Pounds of Sulfur per million Btu	2.89	2.14
Dollars per million Btu	1.41	1.44
Dollars per short ton	33.32	34.40

Ohio

Estimated Total State Energy Consumption, 1991: 3,687 trillion Btu (coal, 1,413; natural gas, 799; petroleum, 1,090; nuclear electric power, 159; hydroelectric power, 2; other, 3; net interstate flow of electricity and associated losses, 221).

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Ohio, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 7; water, 25; truck, 40; tramway/conveyor, 27; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Ohio, 1992
(Million Short Tons)



Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Oklahoma

In 1992 the coal industry in Oklahoma was small. The value of the 2 million short tons produced represented about 1 percent of the estimated value of all mineral commodities produced, including crude oil and natural gas. Coal production from Federal leases generated less than \$0.5 million in royalties, which were shared by the State and the Federal Government.

Oklahoma's economic coal deposits, all bituminous in rank, are in the eastern part of the State. Of the nine coalbeds mined in 1992, the Secor was the leading source of production in 1992. The thickness of the beds mined range from 1 to 3 feet. The heat content of the coal produced averages about 25 million Btu per short ton, and the sulfur content is high, averaging about 3 percent by weight. The coal in some beds has been used to produce coke for the iron and steel industry, but none is currently mined for this purpose.

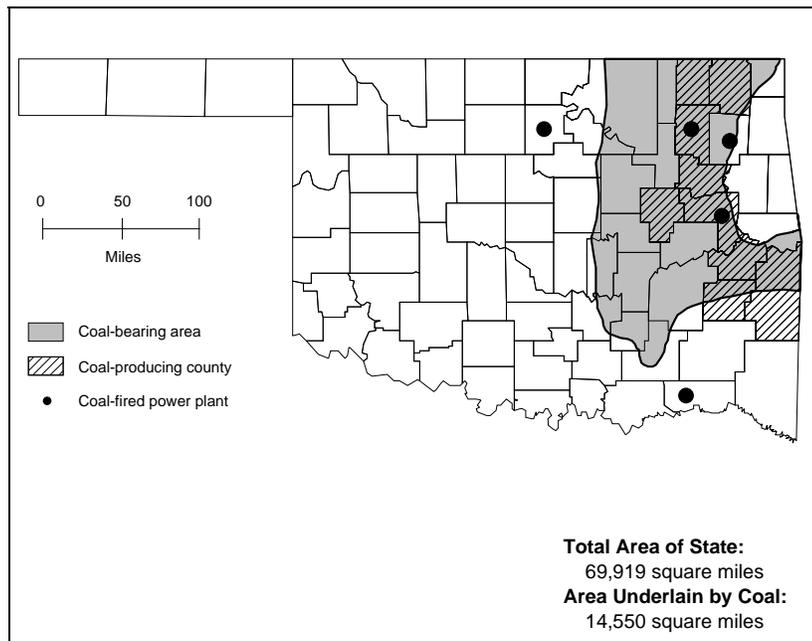
Coal, reportedly, was first used in Oklahoma in the early 1800's by local Indians, who dug it by hand and sold it by the basket. Commercial production began in 1872 with the construction of the Missouri-Kansas-Texas Railroad. From the beginning of the 1900's through World War I, coal was a major fuel in the State. Coal production reached about 5 million short tons in 1920, but then fell, due to the Depression and competition with oil from fields discovered in the State. After rising to meet the demand for coal during World War II, Oklahoma's annual coal output fell below 1 million short tons around the mid-1960's. The demand for the State's coal rose as the result of the Arab oil embargo in 1973, and production reached an all-time record of 6

million short tons in 1978. Since then, however, output has fallen, reflecting a lower demand for the high-sulfur coal produced in the State. Oklahoma's coal production was less than 2 million short tons in 1992.

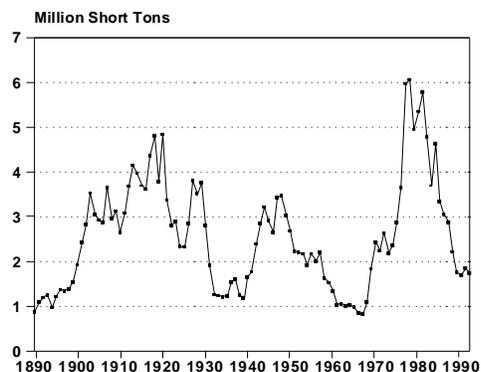
Early production of coal in Oklahoma was almost entirely from underground mines. With the development of large equipment, surface mining became increasingly important and accounted for about half of the annual production in the 1940's and for more than 90 percent in later years. Le Flore, Haskell, and Latimer counties were the leading sources of production in 1992. Latimer County's Red Oak surface mine, operated by Farrell-Cooper Mining Company, was the leading producer. Nearly one-third of Oklahoma's coal output in 1992 was from Federal leases.

The bulk of the coal produced in Oklahoma is consumed in the State, mostly to produce electricity. Electric utilities in Oklahoma are required by State law to blend at least 10 percent Oklahoma coal with coal used from other sources, based on heat value. Electric utilities are by far the largest coal consumers in the State, accounting for more than 90 percent of the 17 million short tons used in 1992. Most of the utility coal used was low-sulfur subbituminous coal from Wyoming. Oklahoma's largest coal-fired generating units, totaling 1,515 megawatts, are at the Muskogee plant of Oklahoma Gas and Electric Company, in Muskogee County. Small amounts of coal were also consumed in other industries, such as paper mills and cement plants.

Oklahoma



Coal Production, 1890-1992



First Year of Documented Coal Production 1880 (120,947 short tons)
Peak Year of Coal Production 1978 (6,070,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	1,238	349	1,587
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	154	67	222
0.61-1.67 (medium sulfur)	243	60	302
> 1.67 (high sulfur)	180	117	297
Total	577	244	821
Estimated Recoverable Reserves at Active Mines, Year-End 1992	W	W	48

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	5	105	26	59
Mines	0	1	1	1	1
Miners	0	NA	36	31	24
Productivity (short tons per miner per hour)	--	NA	1.30	.52	1.04
Average Mine Price (dollars per short ton)	--	NA	W	W	W
Surface					
Quantity (thousand short tons)	5,358	3,332	1,593	1,815	1,683
Mines	37	27	22	21	19
Miners	1,340	1,024	379	379	310
Productivity (short tons per miner per hour)	1.68	1.74	2.17	2.42	2.26
Average Mine Price (dollars per short ton)	27.78	31.72	W	W	W

Total

Oklahoma

Quantity (thousand short tons)	5,358	3,337	1,698	1,841	1,741
Mines	37	28	23	22	20
Miners	1,340	1,024	415	410	334
Productivity (short tons per miner per hour)	1.68	1.74	2.08	2.30	2.17
Average Mine Price (dollars per short ton)	27.78	31.72	30.39	28.52	25.76

Oklahoma

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	1	100
Surface	0	0	0	0	6	68	13	32
All Mines	0	0	0	0	6	65	14	35

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	5,752	12,747	14,866	15,668	16,699
Coke Plants	0	0	0	0	0
Other Industrial	264	852	W	W	W
Residential and Commercial	30	3	W	W	W
Total	6,046	13,602	15,423	16,345	17,430
Year-End Utility Stocks					
(thousand short tons)	5,157	4,194	2,633	2,835	3,066
Electricity Generation					
Total (million kilowatthours)	44,636	44,139	45,063	44,850	45,943
Coal (percent)	22	46	56	58	60
Nuclear (percent)	0	0	0	0	0
Other (percent)	78	54	44	42	40

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	24.97	17.40
Sulfur Content (percent by weight)	2.78	.42
Ash Content (percent by weight)	9.77	5.24
Pounds of Sulfur per million Btu	2.23	.48
Dollars per million Btu	1.17	1.23
Dollars per short ton	29.27	21.47

Oklahoma

Estimated Total State Energy Consumption, 1991: 1,283 trillion Btu (coal, 292; natural gas, 582; petroleum, 432; nuclear electric power, 0; hydroelectric power, 19; other, 0; net interstate flow of electricity and associated losses, -42).

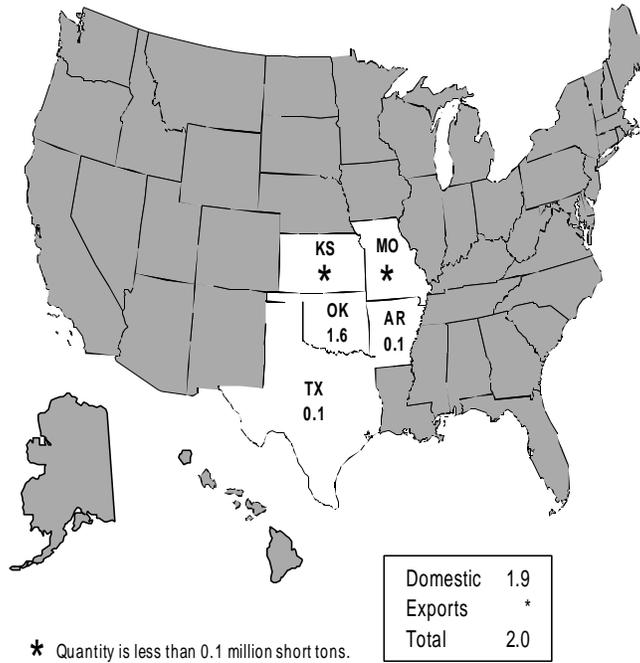
W = Withheld to avoid disclosure of individual company data.

NA = Not available.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

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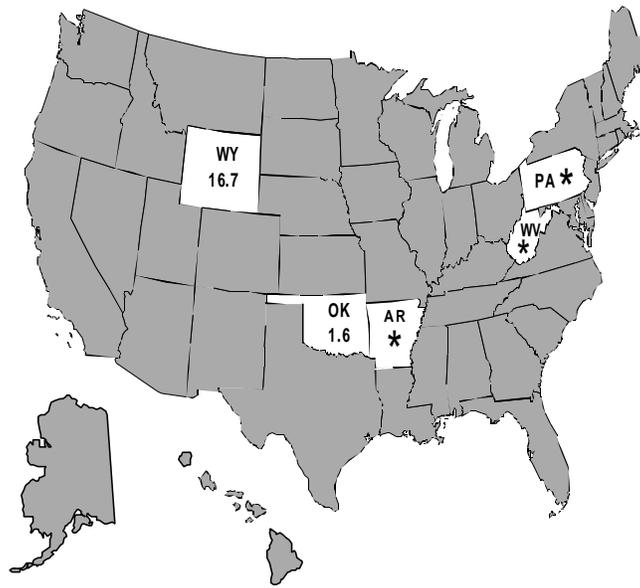
Destination of Coal Produced in Oklahoma, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 9; truck, 91.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Oklahoma, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	18.4
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Pennsylvania

Pennsylvania has long been a major source of coal, leading the Nation in coal production until the early 1950's and ranking among the top coal producers since then. Cumulative production is more than 15 billion short tons, an amount far exceeding that from any other State. In 1992, coal was Pennsylvania's most valuable mineral resource, the value of production representing an estimated 60 percent of the total value of all mineral commodities produced.

Pennsylvania's coal deposits consist of bituminous coal and anthracite. Bituminous coal underlies most of the western part of the State in flat-lying beds. Anthracite deposits occur in four fields in the East and are intensely folded and faulted. Virtually all U.S. anthracite production has been from these fields.

About 40 coalbeds are mined. The major beds of bituminous coal, about 3 to 6 feet thick, are the Pittsburgh, Upper and Lower Freeport, and Upper and Lower Kittanning. An important source of anthracite is the Mammoth coal zone. This comprises several 5- to 6-foot-thick coalbeds that merge in places into one bed more than 50 feet thick. Some bituminous coal is used to produce metallurgical coke. Anthracite is sometimes blended with coking coal to improve the physical properties of the coke produced.

Bituminous coal was first mined in Pennsylvania in 1760 near present-day Pittsburgh. By the mid-1800's, it was widely used as a fuel for domestic use and the salt and glass industries. The State's bituminous coal industry grew with the development of the iron and steel industry and the rising use of coal-fired steam power. Although used by blacksmiths at Wilkes-Barre in 1769, anthracite was not widely accepted as a fuel until the early 1800's, when the problem of keeping it burning was solved by the use of specially designed grates and stoves.

The development of canals, railroads, and river transportation opened up markets for both bituminous coal and anthracite. In 1918, output was a record 277 million short tons, a level unequalled by any other State.

Production dropped during the Depression before climbing to more than 200 million short tons during World War II. Output then decreased due to competi-

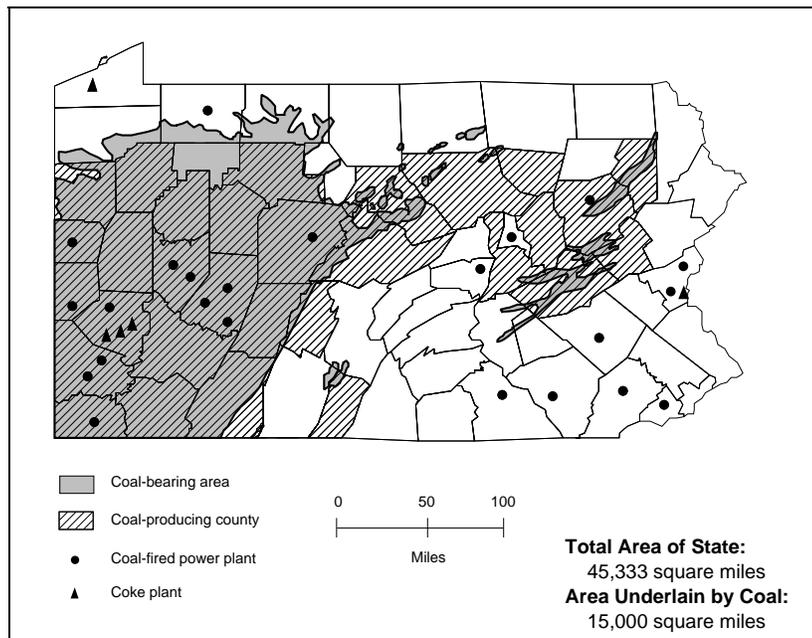
tion from other fuels, the loss of the large railroad market as diesel-electric locomotives replaced coal-fired locomotives, and a falling demand for coal by the iron and steel industry. Anthracite production dropped from over 40 million short tons in 1950 to about 3 million short tons in recent years. Bituminous coal production fell from over 100 million short tons in 1950 to 65 million short tons in 1992.

The dominance of underground coal mining in Pennsylvania declined with the rise in surface mining after World War II. In 1992, underground mines accounted for about two-thirds of the State's output. The Bailey No. 1 mine of Consolidation Coal Company in Greene County was the largest underground coal mine in both the State and the country, producing about 6 million short tons. The company's Bailey coal preparation plant, with a capacity of 3,200 short tons per hour, was the Nation's largest. Greene County was the leading coal-producing county. Anthracite production was chiefly from surface mines in Schuylkill County.

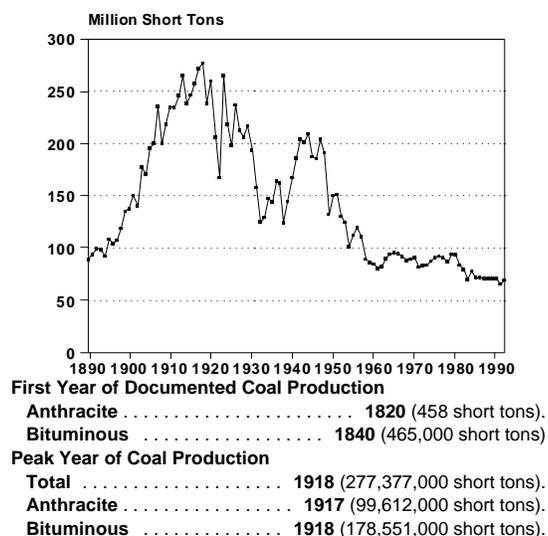
A little more than half of the coal produced from Pennsylvania's mines in 1992 remained in the State. The leading out-of-State shipments were to New York, Ohio, and Maryland. Of the 6 million short tons exported, three-fourths went overseas and the rest to Canada.

In 1992, Pennsylvania was the fourth-largest coal-consuming State, using 56 million short tons. Electric power plants were the principal coal consumers. The State's mines provided about three-fourths of the utility coal used, and West Virginia supplied most of the remainder. Anthracite culm and silt (waste materials from preparation plants) were also used as utility fuel. The State's largest coal-burning generating facility is the 2,360-megawatt Bruce Mansfield plant of Pennsylvania Power Company, in Beaver County. Coke plants, the second-largest coal consumers in the State, received about one-fourth of their needs from Pennsylvania and the rest from West Virginia, Virginia, and Kentucky. Pennsylvania was the largest coke-producing State in 1992, with nearly one-third of the U.S. total. Other industrial consumption was mainly at cement plants and paper mills. Anthracite predominated in the residential and commercial sectors.

Pennsylvania



Coal Production, 1890-1992



Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	24,652	4,537	29,189
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	563	372	936
0.61-1.67 (medium sulfur)	5,541	468	6,009
> 1.67 (high sulfur)	5,367	388	5,756
Total	11,472	1,229	12,700
Estimated Recoverable Reserves at Active Mines, Year-End 1992	723	214	937

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	43,474	36,590	40,530	40,953	45,112
Mines	124	196	153	139	140
Miners	23,442	14,185	9,937	8,751	8,113
Productivity (short tons per miner per hour) .....	.99	1.37	2.12	2.38	2.81
Average Mine Price (dollars per short ton)	37.64	36.25	33.23	31.72	30.23
Surface					
Quantity (thousand short tons)	49,651	34,818	29,984	24,429	23,868
Mines	549	578	520	469	438
Miners	12,476	8,022	5,962	4,755	4,546
Productivity (short tons per miner per hour)	2.11	2.11	2.42	2.53	2.45
Average Mine Price (dollars per short ton)	25.87	29.35	25.91	25.42	25.48

Total

Pennsylvania

Quantity (thousand short tons)	93,125	71,408	70,514	65,381	68,981
Mines	673	774	673	608	578
Miners	35,918	22,207	15,899	13,506	12,659
Productivity (short tons per miner per hour)	1.41	1.65	2.24	2.43	2.67
Average Mine Price (dollars per short ton)	31.12	32.91	30.15	29.40	28.61

Pennsylvania

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	10	65	11	16	30	16	89	3
Surface	1	6	5	16	50	42	382	36
All Mines	11	44	16	16	80	25	471	15

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	42,465	41,713	41,465	40,662	40,407
Coke Plants	17,065	9,762	10,456	8,812	9,868
Other Industrial	4,391	3,852	4,090	4,049	4,243
Residential and Commercial	1,521	1,226	1,308	1,408	1,626
Total	65,442	56,553	57,319	54,931	56,144
Year-End Utility Stocks					
(thousand short tons)	11,622	13,628	14,363	14,412	14,866
Electricity Generation					
Total (million kilowatthours)	122,510	135,018	165,683	162,367	166,034
Coal (percent)	81	74	62	62	62
Nuclear (percent)	10	19	35	35	36
Other (percent)	9	7	3	3	2

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	25.10	24.80
Sulfur Content (percent by weight)	1.85	2.12
Ash Content (percent by weight)	11.59	12.56
Pounds of Sulfur per million Btu	1.47	1.71
Dollars per million Btu	1.46	1.48
Dollars per short ton	36.62	36.81

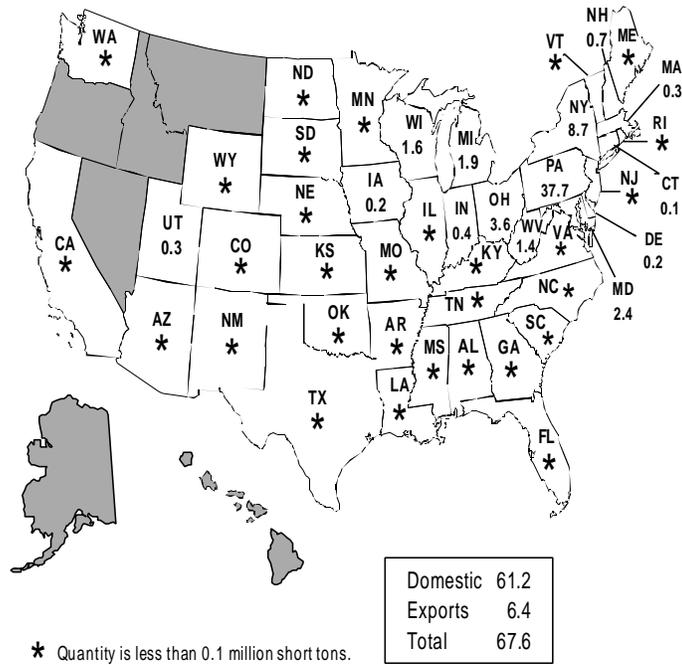
Pennsylvania

Estimated Total State Energy Consumption, 1991: 3,492 trillion Btu (coal, 1,365; natural gas, 662; petroleum, 1,243; nuclear electric power, 617; hydroelectric power, 7; other, 0; net interstate flow of electricity and associated losses, -402).

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Pennsylvania, 1992
(Million Short Tons)

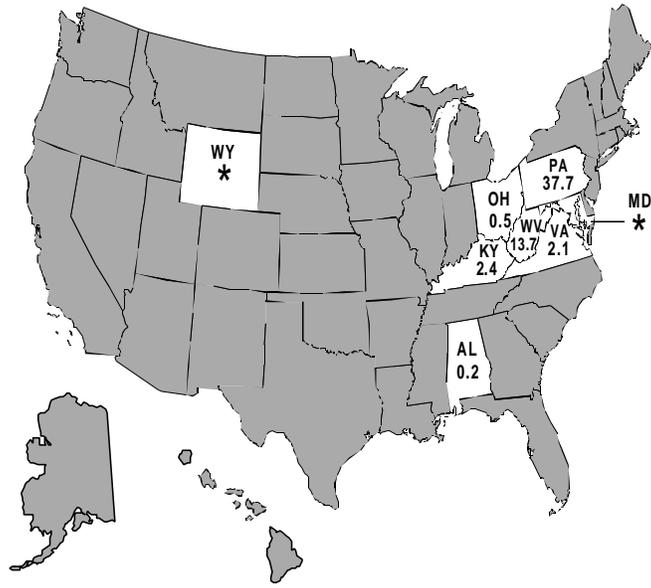


Transportation modes, domestic markets (percent): rail, 46; water, 15; truck, 24; tramway/conveyor, 12; unknown, 2.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Pennsylvania, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	56.7
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Tennessee

Coal is the leading mineral fuel produced in Tennessee. The coal output in 1992 accounted for about 10 percent of the total estimated value of all mineral commodities produced in the State.

Tennessee's coalfields, located in the eastern part of the State, are part of the Appalachian coal region. The coal-bearing area covers a northeasterly trending belt ranging from 50 to 70 miles in width. All the coal is bituminous in rank. Some of it can be converted into metallurgical coke, but none is currently produced for this purpose. Although about 12 coalbeds were mined in 1992, production was largely from the Sewanee, Beach Grove, and Jellico beds, which average 3 to 4 feet in thickness.

The first recorded use of coal in Tennessee was in 1814, when coal was mined by blacksmiths for forging iron near what is now Rockwood, in Roane County. Most of the early efforts to mine Tennessee coal commercially were unsuccessful because of transportation difficulties and lack of steady demand. The arrival of the railroads in the Tennessee coalfields provided a two-fold impetus to mine coal. In addition to transporting coal to distant markets, the railroads were also consumers of coal. Following the completion of the Tennessee Central Railway in the early 1900's, production rose almost steadily through World War I, reaching nearly 7 million short tons.

After a setback due partly to the Depression and the development of hydropower in the State, production expanded to about 8 million short tons during World War II. The postwar coal industry, however, experienced a loss of two of its major markets. Coal once widely used for space heating was replaced by oil and gas, and coal-fired locomotives were phased out by diesel-electric engines. These losses were later offset as coal demand increased when the Tennessee Valley Authority (TVA) constructed a series of coal-fired power plants in the State. As a result, coal output rose

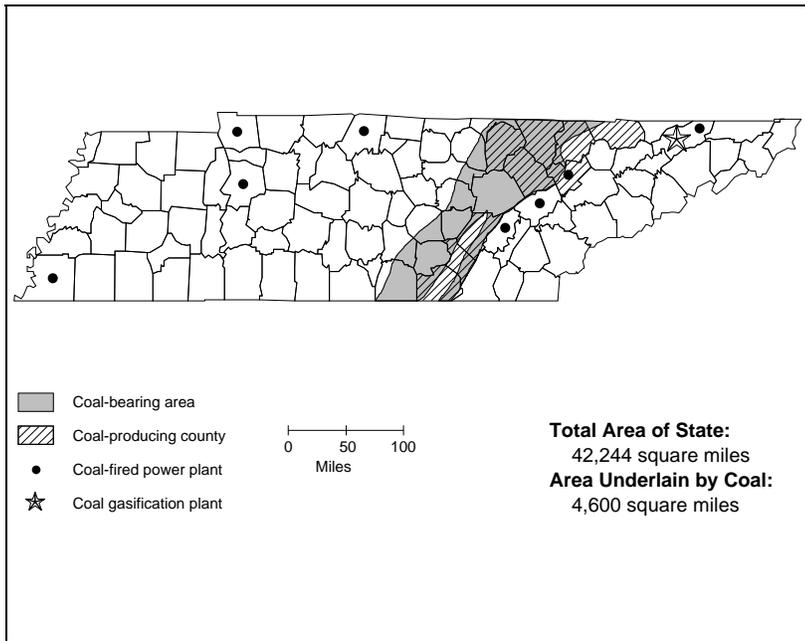
to a record 11 million short tons in 1972. Since then, however, Tennessee's coal production has been trending downward, as the output from surface mines has fallen due to the high cost of working thin, discontinuous coalbeds under thick overburden. The State's coal output dropped to 3 million short tons in 1992.

Underground mines have been the major source of coal production in Tennessee. Before 1938, all coal produced in the State was from underground mines. The output from surface mines gained importance after World War II. In 1992, the leading source of coal was the Underground No. 6 mine of Cross Mountain Coal, Inc., in Campbell County. Tennessee's leading coal-producing counties were Campbell and Sequatchie.

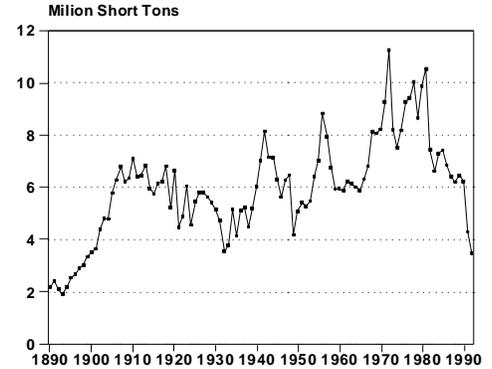
About two-thirds of the coal shipped from Tennessee's mines in 1992 was used to generate electricity, and the rest was mostly for other industrial use. Nearly 60 percent of the coal distributed remained in the State. Most of the shipments out of Tennessee went to Alabama, and a small amount was exported.

More than 80 percent of the 24 million short tons of coal consumed in Tennessee was used to generate electricity. About three-fourths of this coal was from Kentucky; Tennessee's mines supplied about 6 percent of the total. The largest coal-fired power plant in Tennessee is TVA's 2,494-megawatt Cumberland plant, in Stewart County. The leading coal consumer in the industrial sector was Tennessee Eastman Company, a unit of Eastman Chemicals Division of the Eastman Kodak Company, located in Kingsport. The company's coal gasification plant, in operation since 1983, is one of three commercial coal gasification plants in the United States. This coal gasification plant uses coal as a feedstock to manufacture acetic anhydride, used in the production of cellulose acetate for photographic film base.

Tennessee



Coal Production, 1890-1992



First Year of Documented Coal
Production 1840 (558 short tons)
Peak Year of Coal
Production 1972 (11,260,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	551	293	843
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	69	39	108
0.61-1.67 (medium sulfur)	173	118	291
> 1.67 (high sulfur)	60	41	101
Total	302	198	500
Estimated Recoverable Reserves at Active Mines, Year-End 1992	W	W	43

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	4,750	5,204	4,526	3,060	2,039
Mines	54	70	61	50	37
Miners	2,076	1,871	1,319	988	599
Productivity (short tons per miner per hour)	1.21	1.50	1.68	1.72	1.81
Average Mine Price (dollars per short ton)	29.09	29.71	W	W	W
Surface					
Quantity (thousand short tons)	5,100	2,242	1,666	1,230	1,437
Mines	63	48	25	22	13
Miners	1,539	751	378	254	205
Productivity (short tons per miner per hour)	1.57	1.55	2.32	2.45	3.06
Average Mine Price (dollars per short ton)	25.92	25.78	W	W	W

Tennessee

Total					
Quantity (thousand short tons)	9,850	7,446	6,193	4,290	3,476
Mines	117	118	86	72	50
Miners	3,615	2,622	1,697	1,242	804
Productivity (short tons per miner per hour)	1.36	1.51	1.81	1.88	2.19
Average Mine Price (dollars per short ton)	27.54	28.54	27.96	26.74	27.11

Tennessee

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	1	37	4	29	32	34
Surface	0	0	0	0	5	85	8	15
All Mines	0	0	1	22	9	52	40	26

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	21,679	20,853	20,814	19,216	20,263
Coke Plants	W	W	W	W	0
Other Industrial	W	W	3,779	3,702	3,682
Residential and Commercial	W	W	W	W	157
Total	24,496	25,105	24,878	23,107	24,102
Year-End Utility Stocks (thousand short tons)					
	9,200	3,846	3,596	3,148	3,016
Electricity Generation					
Total (million kilowatthours)	60,211	66,581	73,903	73,932	75,395
Coal (percent)	84	75	68	63	66
Nuclear (percent)	1	15	19	22	21
Other (percent)	15	10	13	15	13

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	25.34	24.36
Sulfur Content (percent by weight)	1.39	2.02
Ash Content (percent by weight)	9.63	8.31
Pounds of Sulfur per million Btu	1.10	1.66
Dollars per million Btu	1.33	1.27
Dollars per short ton	33.63	31.01

Tennessee

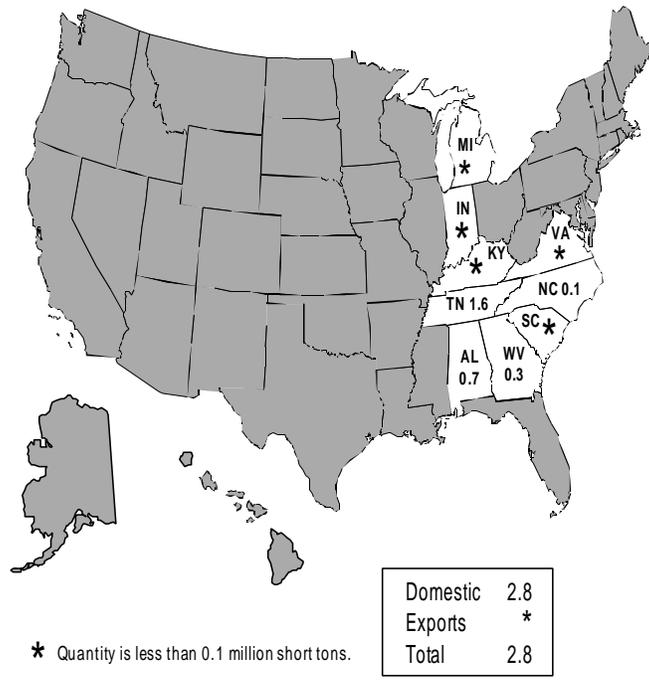
Estimated Total State Energy Consumption, 1991: 1,747 trillion Btu (coal, 566; natural gas, 235; petroleum, 567; nuclear electric power, 178; hydroelectric power, 109; other, 0; net interstate flow of electricity and associated losses, 93.

W = Withheld to avoid disclosure of individual company data.

Notes: **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Totals may not equal sum of components because of independent rounding. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons. Coal receipts are based on distribution data and may not have actually been received during the year.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Tennessee, 1992
(Million Short Tons)

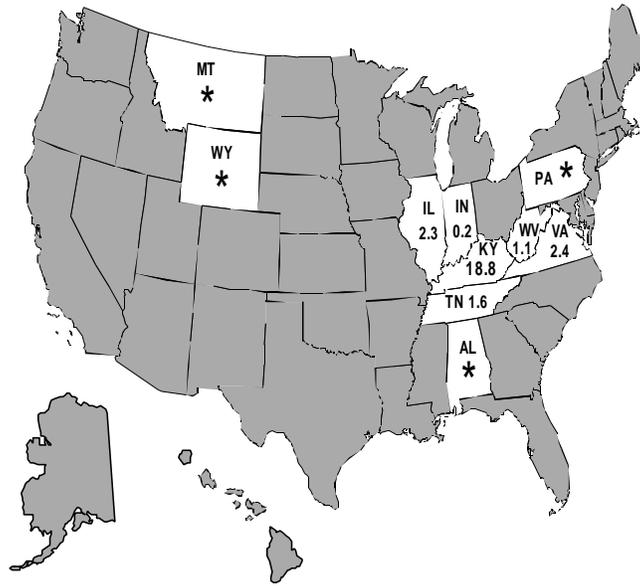


Transportation modes, domestic markets (percent): rail, 60; water, 24; truck, 14; unknown, 2.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Tennessee, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	26.6
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Texas

Texas ranks first in the United States in the production of lignite. Although greatly overshadowed by crude oil and natural gas production, coal holds an important place in the Texas energy scene.

The lignite deposits in Texas occur chiefly in northeasterly trending belts in the eastern part of the State. The largest commercial deposits are in the Wilcox Formation. The beds mined range from 3 to 10 feet in thickness, although in places two or more beds merge to form a single bed over 20 feet thick. Bituminous coal is found in the north-central, southern, and southwestern parts of Texas, typically in beds 3 feet or less in thickness. Currently, the only bituminous coal produced is from Webb County and is the variety called "cannel coal."

Lignite deposits in Texas were first reported in 1818 and bituminous coal was discovered by the mid-1800's. The early coal industry in Texas produced lignite for local domestic heating and steam generation at cotton gins and other industrial plants. Bituminous coal was produced chiefly for railroad fuel. Total annual coal production reached more than 2 million short tons before 1920. Subsequently, annual coal production declined as markets were lost to oil and gas produced from numerous fields discovered in the State. Bituminous coal production virtually ceased by 1944, but lignite production continued on a small scale due to the establishment of several industrial markets near lignite deposits. Since 1922, lignite has been used to manufacture activated carbon at a plant in Marshall. In 1926, the Texas Utilities Generating Company began operating the State's first lignite-fired power plant, the Trinidad, in Henderson County. This plant generated electricity from lignite until it converted to natural gas in the early 1940's. The Aluminum Corporation of America has been using lignite since 1954 to generate electricity for its smelter at Rockdale.

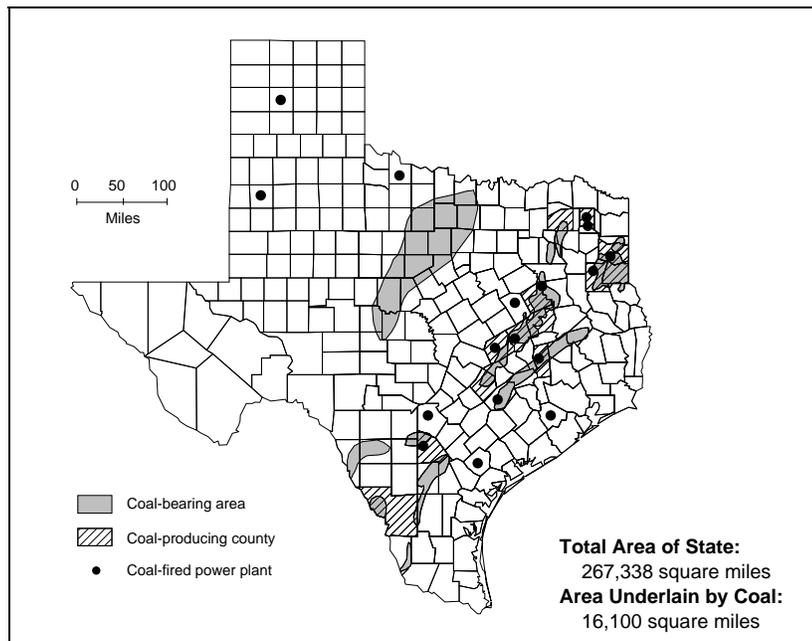
The period from the mid-1960's to the mid-1970's was a pivotal time in the development of lignite in Texas as rising natural gas prices created serious concern about economical future sources of energy in the State. In

1971, Texas Utilities Generating Company began operating its newly constructed Big Brown power plant with lignite produced from the nearby Big Brown surface mine. This demonstrated the feasibility of using Texas lignite on a large scale for electricity generation. Further impetus to develop Texas lignite came from the 1973-74 Arab oil embargo and the 1976 order from the Texas Railroad Commission, the State's energy regulatory agency, that limited the future use of natural gas as boiler fuel. At the time, natural gas accounted for more than 85 percent of the electricity generated in Texas, while coal accounted for about 10 percent. The opening of new mines to supply other lignite-fueled power plants in the State contributed to the steady growth of Texas coal output. About 55 million short tons were produced in 1992.

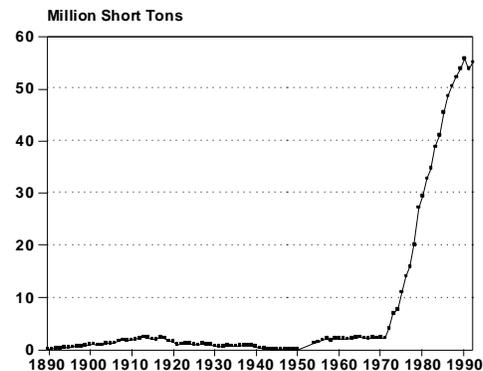
Early coal mining in Texas was mostly by underground methods, but current production is entirely from surface mines. Several of these mines rank among the largest in the United States. The State's largest coal mine, producing about 11 million short tons in 1992, was the Martin Lake mine of Texas Utilities Mining, in Panola County. The top three coal-producing counties were Panola, Titus, and Leon. All of the coal produced (virtually all lignite with less than 1 percent bituminous coal) in Texas was used in the State.

The Nation's leading coal-consuming State since 1981, Texas used 91 million short tons in 1992. Electric power plants were by far the dominant markets, accounting for nearly all of the total. Texas lignite comprised about 60 percent of the utility coal, with Wyoming subbituminous coal accounting for nearly all of the balance. In 1992, the electricity generated from coal in Texas ranked second in the Nation after Ohio. The largest coal-fired generating facility is the 2,335-megawatt W. A. Parrish plant of Houston Lighting and Power Company, in Fort Bend County. The plant uses Wyoming coal. Small amounts of coal are consumed mostly in manufacturing activated carbon, cement, and lime, and for generating electricity for aluminum production. Coke production for the State's iron and steel industry ended in 1987.

Texas



Coal Production, 1890-1992



First Year of Documented Coal Production 1884 (125,000 short tons)
Peak Year of Coal Production 1990 (55,755,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	0	13,266	13,266
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	0	0	0
0.61-1.67 (medium sulfur)	0	6,368	6,368
> 1.67 (high sulfur)	0	3,844	3,844
Total	0	10,212	10,212
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	1,188	1,188

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	29,354	45,459	55,755	53,825	55,071
Mines	10	14	15	15	15
Miners	1,780	2,360	2,131	2,149	2,001
Productivity (short tons per miner per hour)	5.93	6.26	7.48	7.17	7.34
Average Mine Price (dollars per short ton)	7.67	11.60	11.20	12.21	12.42

Total

Texas

Quantity (thousand short tons)	29,354	45,459	55,755	53,825	55,071
Mines	10	14	15	15	15
Miners	1,780	2,360	2,131	2,149	2,001
Productivity (short tons per miner per hour)	5.93	6.26	7.48	7.17	7.34
Average Mine Price (dollars per short ton)	7.67	11.60	11.20	12.21	12.42

Texas

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface	11	99	0	0	4	1	0	0
All Mines	11	99	0	0	4	1	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	45,351	71,818	87,248	87,856	87,236
Coke Plants	W	W	0	0	0
Other Industrial	W	W	4,157	4,198	4,225
Residential and Commercial	W	W	10	11	10
Total	48,602	77,017	91,415	92,064	91,471
Year-End Utility Stocks					
(thousand short tons)	4,882	9,103	8,531	10,474	10,287
Electricity Generation					
Total (million kilowatthours)	202,989	218,510	234,047	238,343	239,807
Coal (percent)	31	45	51	50	49
Nuclear (percent)	0	0	7	8	10
Other (percent)	69	55	42	42	41

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	12.45	14.47
Sulfur Content (percent by weight)	1.05	.76
Ash Content (percent by weight)	17.42	12.33
Pounds of Sulfur per million Btu	1.69	1.05
Dollars per million Btu	1.19	1.49
Dollars per short ton	14.79	21.58

Texas

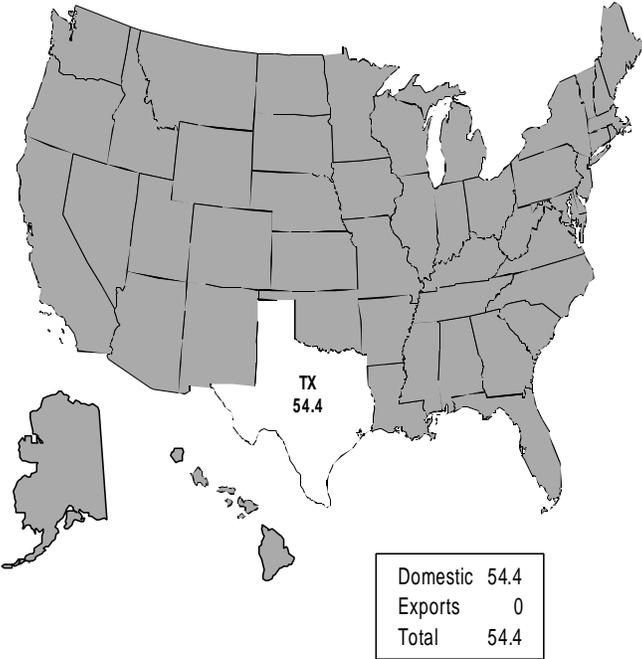
Estimated Total State Energy Consumption, 1991: 9,785 trillion Btu (coal, 1,333; natural gas, 3,716; petroleum, 4,441; nuclear electric power, 213; hydroelectric power, 18; other, 3; net interstate flow of electricity and associated losses, 61.

W = Withheld to avoid disclosure of individual company data.

Notes: **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Totals may not equal sum of components because of independent rounding. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing Counties shown on map exclude any County where all 1992 output was from mines producing less than 10,000 short tons. Coal receipts are based on distribution data and may not have actually been received during the year.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

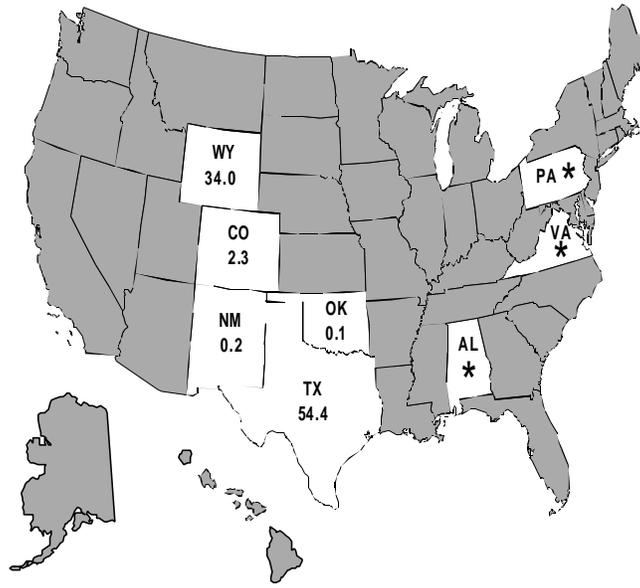
Destination of Coal Produced in Texas, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 47; truck, 24; tramway/conveyor, 29.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Texas, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	91.1
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Utah

Coal accounted for about 18 percent of the estimated value of mineral commodities produced in Utah in 1992. Royalties from coal production from Federal leases totaled \$30 million, which was disbursed to the State and the Federal Government.

Although coal deposits are widespread in Utah, production is currently from Wasatch Plateau, Book Cliffs, and Emery coalfields. These fields have sizable reserves of high-quality bituminous coal in relatively thick, continuous beds. Because the coalbeds in these fields generally occur near the base of high escarpments, mine entries are driven horizontally into the coalbeds. However, a few mines also have shafts to provide vertical access to the coal. Some coal in the Book Cliffs field has good coking properties and is used in blends to manufacture metallurgical coke. The leading sources of coal from the 10 coalbeds mined in 1992 were the Aberdeen, Hiawatha, and Blind Canyon, which range from 4 to 12 feet in thickness.

Coal was first mined in Utah in the early 1850's near what is now Cedar City, in the southwestern part of the State, for blacksmiths and settlements. The Coalville area in northern Utah became the State's major source of coal about 1870 with the opening of a mine to provide heating fuel for Salt Lake City. Coal development in the area was spurred by a \$1,000 reward offered in 1854 by the Territorial Legislature to the discoverer of a coal supply within 40 miles of Salt Lake City. Other coal deposits were developed later to supply fuel for the transcontinental railroad and branch railroads constructed in Utah and for manufacturing coke to smelt iron ore found in the State.

Utah's coal production reached 6 million short tons in 1920 under the stimulus of World War I and rising shipments of Utah coal to other States. In the 1930's, annual production decreased as markets were lost to competition from fuel oil and natural gas and the economic decline during the Depression. Production rose to more than 7 million short tons to meet the demands of

World War II and the postwar boom. By the mid-1960's, however, Utah's annual coal output fell

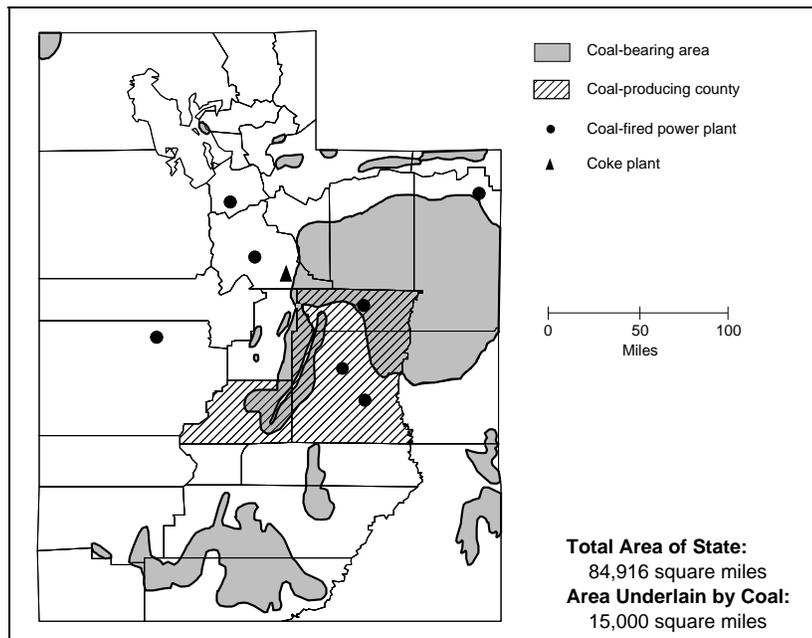
to about 4 million short tons, due mostly to the replacement of coal-burning locomotives with diesel-powered locomotives. Utah's coal production then became largely dependent on the demand for coking coal by the iron and steel industry. Utah's coal industry was revitalized in the 1970's when the Arab oil embargo renewed interest in domestic coal as a source of utility fuel. As new mines were opened and existing mines expanded to supply coal mainly for new coal-fired power plants constructed in Utah, the State's coal output trended sharply upward. Production was 21 million short tons in 1992.

Utah's coal is mined exclusively by underground methods. The State's largest coal mine in 1992, producing about 5 million short tons, was the Skyline mine of Coastal States Energy Company, in Carbon County. Carbon and Emery counties were the State's leading sources of coal. More than 80 percent of Utah's 1992 coal production was from Federal leases.

About 60 percent of the coal produced in Utah in 1992 was delivered to consumers in the State. Shipments out of State were chiefly to California and Nevada. Three-fourths of the coal distributed went to power plants. The balance was mostly for industrial use, including coke production, and a small amount was exported overseas.

Power plants are by far the leading coal consumers in Utah, accounting for most of the 16 million short tons used in 1992. Utah's mines supplied the bulk of the utility coal required, with the balance received chiefly from Colorado. The largest generating facility is the 1,600-megawatt Intermountain power plant, operated by the City of Los Angeles, in Millard County. About half of the coking coal used in Utah was produced in the State, and the rest was from Pennsylvania, Virginia, and Colorado. Other users of industrial coal, all from Utah's mines, were mainly manufacturers of copper and cement. A small amount of fossil resin has been extracted intermittently since 1929 from coal from the Wasatch Plateau field. The resin is used to produce adhesives, rubber, paint, thermoplastics, and varnish for printing ink.

Utah



Coal Production, 1890-1992



First Year of Documented Coal Production 1870 (5,800 short tons)
Peak Year of Coal Production 1990 (22,058,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	5,822	268	6,090
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	1,040	40	1,081
0.61-1.67 (medium sulfur)	1,346	103	1,449
> 1.67 (high sulfur)	468	69	536
Total	2,854	212	3,066
Estimated Recoverable Reserves at Active Mines, Year-End 1992	488	0	488

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	13,236	12,780	22,058	21,945	21,339
Mines	29	22	18	15	15
Miners	3,512	2,563	2,434	2,277	1,997
Productivity (short tons per miner per hour)	1.96	2.80	4.74	4.80	5.46
Average Mine Price (dollars per short ton)	25.63	27.69	18.53	22.59	21.11
Surface					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--

Total

Utah

Quantity (thousand short tons)	13,236	12,780	22,058	21,945	21,339
Mines	29	22	18	15	15
Miners	3,512	2,563	2,434	2,277	1,997
Productivity (short tons per miner per hour)	1.96	2.80	4.74	4.80	5.46
Average Mine Price (dollars per short ton)	25.63	27.69	18.53	22.59	21.11

Utah

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	6	84	2	7	7	9	0	0
Surface	0	0	0	0	0	0	0	0
All Mines	6	84	2	7	7	9	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	4,895	6,325	13,563	12,829	13,857
Coke Plants	W	W	W	W	W
Other Industrial	501	472	676	508	535
Residential and Commercial	W	W	W	W	W
Total	7,106	8,303	15,738	14,834	15,729
Year-End Utility Stocks					
(thousand short tons)	1,092	997	3,697	4,123	3,153
Electricity Generation					
Total (million kilowatthours)	12,112	15,411	32,260	30,158	32,909
Coal (percent)	90	92	98	96	96
Nuclear (percent)	0	0	0	0	0
Other (percent)	10	8	2	4	4

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	23.09	22.77
Sulfur Content (percent by weight) .....	.46	.47
Ash Content (percent by weight)	10.85	11.24
Pounds of Sulfur per million Btu .....	.40	.41
Dollars per million Btu	1.23	1.21
Dollars per short ton	28.31	27.54

Utah

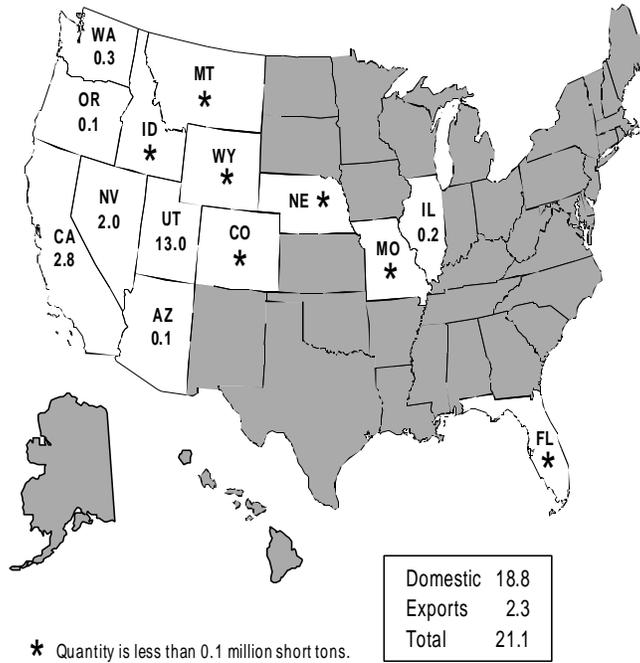
Estimated Total State Energy Consumption, 1991: 566 trillion Btu (coal, 345; natural gas, 143; petroleum, 207; nuclear electric power, 0; hydroelectric power, 6; other, 4; net interstate flow of electricity and associated losses, -138).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

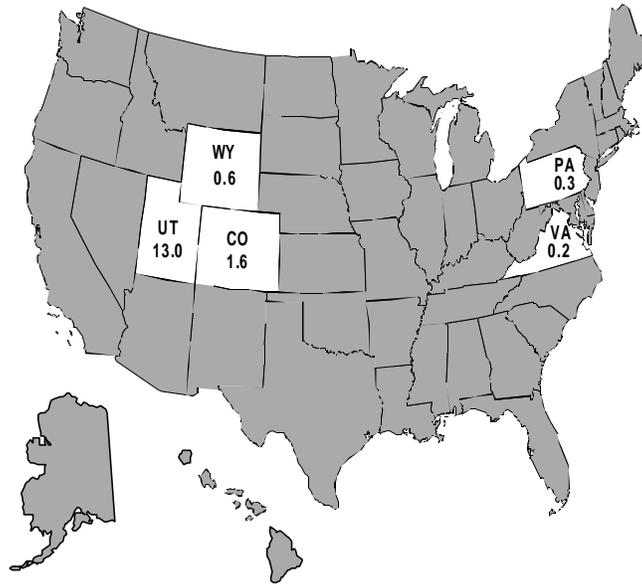
Destination of Coal Produced in Utah, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 52; truck, 33; tramway/conveyor, 15; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Utah, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	15.7
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Virginia

Coal is the most valuable of Virginia's mineral commodities. The 1992 coal production was estimated to account for more than two-thirds of the total value of all minerals produced in the State, including crude oil and natural gas.

Coal occurs in Virginia in three separate areas: the Eastern fields, consisting of two basins located west of Richmond; the Valley fields, comprising narrow coal-bearing areas in the west-central part of the State; and the Southwest field, which is part of the Appalachian coal basin. The Southwest field contains most of Virginia's coal reserves and is the source of virtually all of the State's coal production.

Only bituminous coal is currently produced in Virginia, although semianthracite has been produced in the Valley fields. About half of Virginia's coal output is estimated to be metallurgical coal, used to make coke for the iron and steel industry in the United States and other countries. Although more than 40 coalbeds were mined in 1992, the leading sources of output were the Pocahontas No. 3 (an important source of metallurgical coal) and Jawbone. Coalbed thickness is 4 to 5 feet.

The first commercial production of coal in the United States began near Richmond in 1748. Consumers of this coal included local blacksmiths and iron foundries. After the Revolutionary War, production of Richmond coal rose to a peak of 175,000 short tons in 1835 and ended in the 1920's, due to competition from other coalfields. Production from the Valley coalfields trended upward in the late 1800's after railroads were constructed to the mines. It reached more than 200,000 short tons annually in the 1930's and early 1940's before virtually ending in 1971. The Southwest coalfield became the center of Virginia's coal industry in the late 1800's, when an extensive railroad system linked the area with coal consumers in Virginia and other States and to ports at Norfolk. Coke production began in the Southwest field in 1883.

Annual coal production in Virginia grew to 14 million short tons in 1926 and then dropped below 8 million short tons during the Depression. It later recovered and reached 20 million short tons during World War II. In the decade

following the war, the State's coal industry suffered losses as railroads converted from coal to oil, and heating fuel markets switched to oil and natural gas. Production declined to a postwar low of about 16 million short tons in 1949 before recovering to trend generally upward to more than 40 million short tons in recent years. Initially, the increase was due largely to a growing demand for coking coal. Later, the upward trend was sustained by a rising demand for utility coal. Virginia's coal output was 43 million short tons in 1992.

Underground mines have always produced most of Virginia's coal. In recent years, they accounted for more than 80 percent of the State's total coal output. Surface coal mining in Virginia began in the 1920's and reached a peak in the mid 1970's. Virginia's largest mine, producing over 2 million short tons in 1992, was the underground Buchanan No. 1 mine of Consolidation Coal Company, in Buchanan County. The State's leading coal-producing counties were Buchanan and Wise.

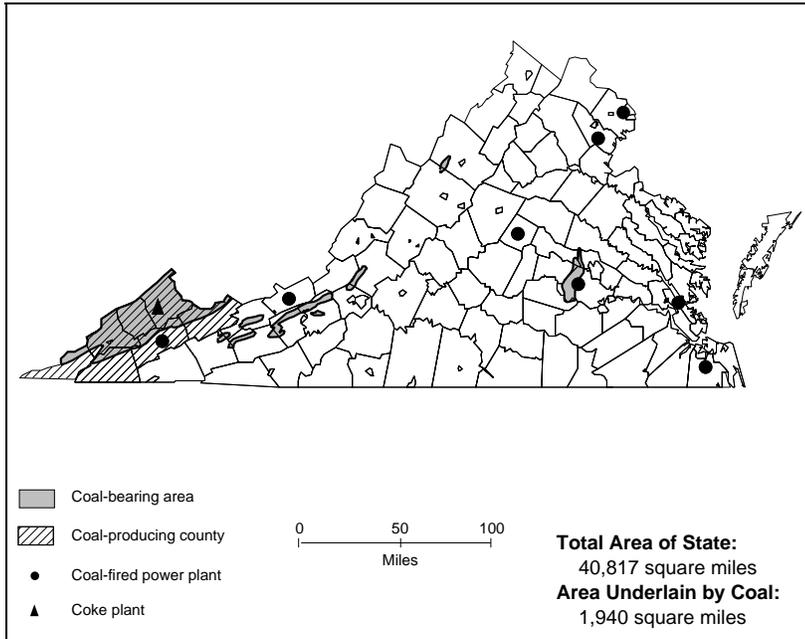
Of the coal shipped from Virginia's mines in 1992, about 60 percent was for U.S. markets and the rest was exported. A little more than half of the out-of-State shipments was utility coal, delivered chiefly to power plants in North Carolina. Nearly one-third was coking coal for consumers mostly in Indiana and Pennsylvania.

More than 60 percent of the 13 million short tons of coal consumed in Virginia in 1992 was for generating electricity. About 40 percent of the utility coal was produced in Virginia, with nearly all of the balance received from Kentucky and West Virginia. Virginia's largest coal-fired generating utility is the 1,250-megawatt Chesterfield plant of Virginia Electric and Power Company, in Chesterfield County. All of the coking coal used at the State's only coke plant, in Vansant, was from Virginia. Other industrial coal consumers in Virginia are manufacturers of paper, paperboard, and synthetic fibers. These consumers use coal from Virginia, West Virginia, and Kentucky.

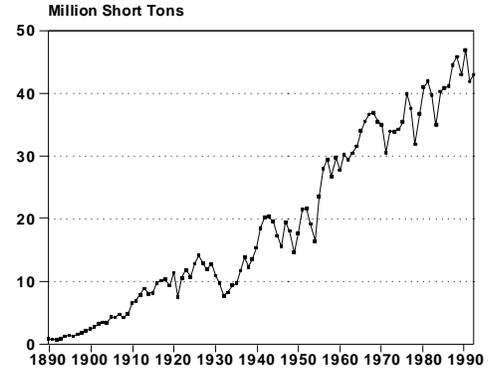
In recent years, Virginia has ranked as the second-largest coal exporting State, following West Virginia. About 90

percent of Virginia's coal exports were estimated to be metallurgical coal. Norfolk, Virginia, is the leading U.S. Customs District for coal exports, handling coal from Virginia and other States. The three coal-handling terminals are Lamberts Point Coal Pier No. 6, Dominion Terminals Associates, and Pier IX Terminal. In 1992, coal exports through the Norfolk Customs District totaled 53 million short tons, accounting for 52 percent of U.S. coal exports.

Virginia



Coal Production, 1890-1992



First Year of Documented Coal Production 1748 (50 short tons)
Peak Year of Coal Production 1990 (46,917,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	1,816	730	2,546
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	654	252	905
0.61-1.67 (medium sulfur)	366	216	582
> 1.67 (high sulfur)	0	0	0
Total	1,020	468	1,487
Estimated Recoverable Reserves at Active Mines, Year-End 1992	323	43	366

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	32,358	33,550	39,150	34,138	34,715
Mines	387	390	258	222	196
Miners	13,569	11,553	8,955	8,515	7,888
Productivity (short tons per miner per hour)	1.27	1.72	2.14	2.12	2.20
Average Mine Price (dollars per short ton)	36.47	30.37	28.39	27.76	27.88
Surface					
Quantity (thousand short tons)	8,651	7,390	7,767	7,816	8,308
Mines	115	119	82	72	62
Miners	2,307	1,715	1,387	1,540	1,250
Productivity (short tons per miner per hour)	1.91	2.37	2.89	2.95	3.50
Average Mine Price (dollars per short ton)	28.05	29.18	26.32	26.12	26.17

Total

Virginia

Quantity (thousand short tons)	41,009	40,940	46,917	41,954	43,024
Mines	502	509	340	294	258
Miners	15,876	13,268	10,342	10,055	9,138
Productivity (short tons per miner per hour)	1.37	1.81	2.24	2.23	2.37
Average Mine Price (dollars per short ton)	34.58	30.16	28.05	27.45	27.55

Virginia

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	7	32	5	9	72	45	112	14
Surface	0	0	1	7	26	80	35	13
All Mines	7	26	6	9	98	52	147	13

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	5,560	7,166	8,228	8,568	8,639
Coke Plants	W	W	W	W	W
Other Industrial	2,875	3,334	3,756	4,301	3,594
Residential and Commercial	W	W	W	W	W
Total	9,291	11,656	13,105	13,980	13,397
Year-End Utility Stocks					
(thousand short tons)	1,251	1,682	1,639	1,685	1,922
Electricity Generation					
Total (million kilowatthours)	34,306	42,084	47,200	48,941	48,910
Coal (percent)	39	42	44	45	46
Nuclear (percent)	33	53	50	49	48
Other (percent)	28	5	6	6	6

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	25.74	25.66
Sulfur Content (percent by weight)	1.10	1.03
Ash Content (percent by weight)	9.67	9.48
Pounds of Sulfur per million Btu .....	.85	.80
Dollars per million Btu	1.64	1.47
Dollars per short ton	42.21	37.81

Virginia

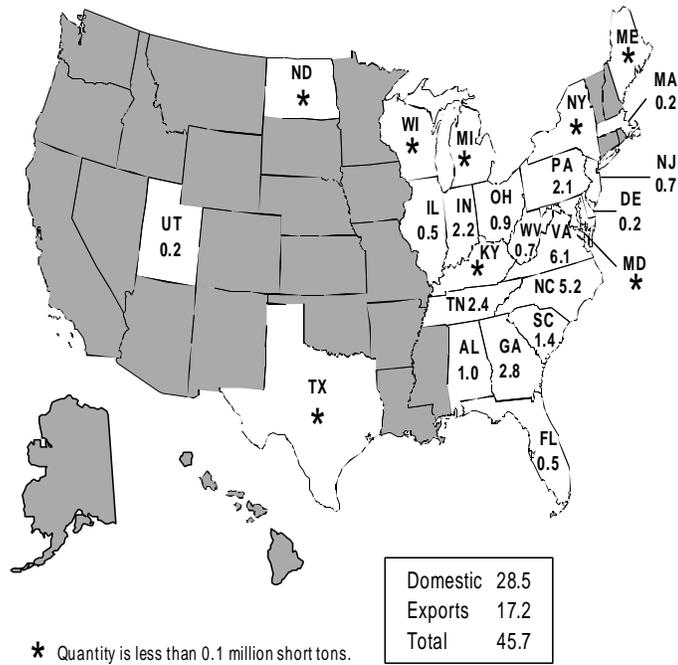
Estimated Total State Energy Consumption, 1991: 1,848 trillion Btu (coal, 357; natural gas, 182; petroleum, 744; nuclear electric power, 257; hydroelectric power, <1; other, <1; net interstate flow of electricity and associated losses, 309).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

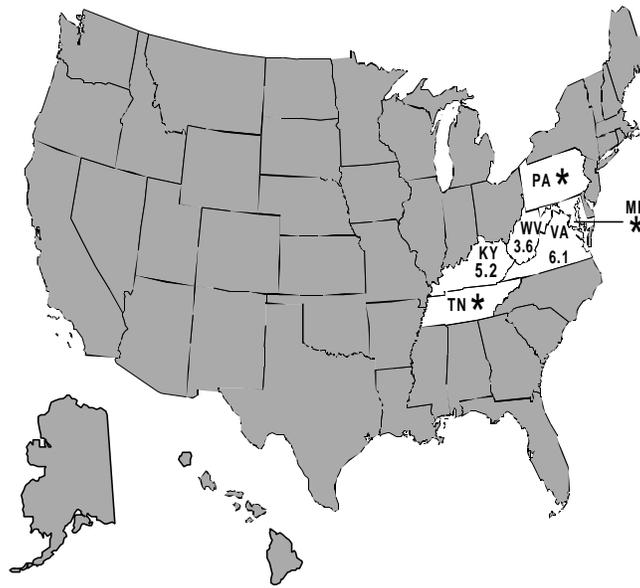
Destination of Coal Produced in Virginia, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 78; water, 13; truck, 1; tramway/conveyor, 3; unknown, 4.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Virginia, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	14.9
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Washington

Coal is an important part of the mineral economy of Washington. In 1992, coal was estimated to be the second-highest valued mineral commodity produced in the State, after sand and gravel, accounting for nearly one-fifth of the estimated value of all mineral commodities produced. A Federal coal lease generated \$2 million in royalties, which were disbursed to the State and the Federal Government. Although coal is the only mineral fuel produced in Washington, its role as an energy source is greatly overshadowed by the abundance of hydroelectric power in the State.

The principal coal deposits in Washington occur in small areas in the western half of the State. The major economic coal deposits are located along the western slope of the Cascade Mountains. All ranks of coal, from lignite to anthracite, are present in Washington, but production consists predominantly of subbituminous coal, with a small amount of bituminous coal. Although some Washington coal is suitable for conversion to coke for metallurgical use, none has been mined for this purpose since World War II.

The coalbeds in Washington are commonly folded and faulted, features that hamper mining. Only a few areas are suitable for surface mining. The high ash content characteristic of many coalbeds in the State is due to volcanic ash that fell when the coal-forming plant material was deposited. Production in 1992 was from about eight coalbeds ranging from 8 to 50 feet in thickness. The major bed is the Big Seam, which averages about 26 feet in thickness.

The earliest recorded discovery of coal in Washington was in 1833, along the Toutle River in what is now Cowlitz County. The State's first coal mine was opened in 1853 near Bellingham, Whatcom County. Soon after, mining began in other areas, and by 1880 all of the State's major coal deposits were being produced. Totalling 2 million short tons in 1900, production doubled by 1918, reflecting an increase in demand created by World War I. Early coal consumers in the State included railroads, electric utilities, cement mills, coke plants, briquette producers, smelters,

and manufactured gas plants. Coal was also shipped to California.

After World War I, annual coal production trended downward as consumers switched to oil or turned to less expensive coal from Utah and Wyoming. In the 1930's, the coal industry suffered as the State's large hydroelectric resources were developed to provide low-cost electricity. Coal production dropped below 2 million short tons in the 1930's and fell to 37,000 short tons by 1970.

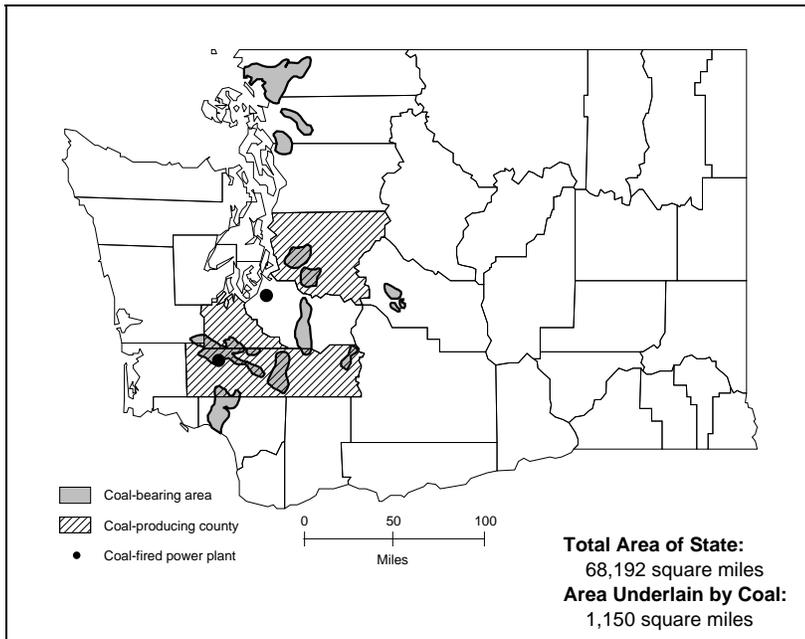
Interest in Washington's coal was renewed in the 1960's when projections of future electricity requirements escalated beyond the capability of the State's hydroelectric plants. This led to the opening of the Centralia surface coal mine, in Lewis and Thurston counties, to produce subbituminous coal for the Centralia power plant of PacifiCorp, constructed near the mine in Lewis County. In 1971, when the plant's first electric generating unit was placed in service, coal output rose above 1 million short tons. The following year, it more than doubled to fuel a second generating unit at the plant, which has a total generating capability of 1,310 megawatts. Since then, annual production has ranged from 4 to 5 million short tons; in 1992, nearly one-third of the mine's output was from a Federal coal lease. A subsidiary of PacifiCorp operates the mine.

Although the Centralia mine accounts for most of Washington's coal output, a smaller coal mine has been in operation since 1986. This is the John Henry No. 1 surface mine of Pacific Coal Coast Company, located about 50 miles northeast of Centralia, in King County. The mine's production, all bituminous coal, totaled about 300,000 short tons in 1992. About three-fourths of the output was exported to Japan and Korea. The export coal was carried by rail to Westshore Terminals at the Port of Vancouver, Canada, for loading into colliers. The balance of the mine's output was used in Washington.

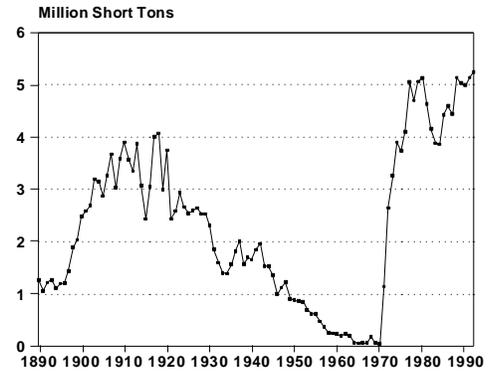
Virtually all of the 6 million short tons of coal consumed in Washington in 1992 was for generating electricity. Nearly all of the utility coal used was from the Centralia

mine, with a smaller amount from the John Henry No. 1 mine. Supplementing this supply was coal from Montana and Utah. Of the coal used for other purposes, nearly two-thirds was from Utah, with the balance mostly from Washington and Colorado. The principal industrial users of coal in Washington were manufacturers of cement, pulp, and nonmetallic products.

Washington



Coal Production, 1890-1992



First Year of Documented Coal Production 1860 (5,374 short tons)
Peak Year of Coal Production 1992 (5,251,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	1,332	86	1,419
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	155	0	155
0.61-1.67 (medium sulfur)	520	68	588
> 1.67 (high sulfur)	0	0	0
Total	675	68	743
Estimated Recoverable Reserves at Active Mines, Year-End 1992	0	W	W

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	0	0	0	0	0
Mines	0	0	0	0	0
Miners	0	0	0	0	0
Productivity (short tons per miner per hour)	--	--	--	--	--
Average Mine Price (dollars per short ton)	--	--	--	--	--
Surface					
Quantity (thousand short tons)	5,140	4,438	5,001	5,143	5,251
Mines ¹	2	3	4	3	3
Miners	597	677	777	638	612
Productivity (short tons per miner per hour)	4.17	3.15	3.41	3.97	4.51
Average Mine Price (dollars per short ton)	W	W	W	W	W

Total

Washington

Quantity (thousand short tons)	5,140	4,438	5,001	5,143	5,251
Mines	2	3	4	3	3
Miners	597	677	777	638	612
Productivity (short tons per miner per hour)	4.17	3.15	3.41	3.97	4.51
Average Mine Price (dollars per short ton)	W	W	W	W	W

Washington

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	0	0	0	0	0	0	0	0
Surface ¹	2	94	0	0	1	6	0	0
All Mines ¹	2	94	0	0	1	6	0	0

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	4,950	5,192	4,852	5,184	6,148
Coke Plants	0	0	0	0	0
Other Industrial	332	208	229	197	194
Residential and Commercial	161	216	66	80	91
Total	5,443	5,616	5,147	5,461	6,433
Year-End Utility Stocks					
(thousand short tons)	1,704	378	1,316	1,145	697
Electricity Generation					
Total (million kilowatthours)	92,325	93,140	100,479	101,353	84,112
Coal (percent)	8	8	7	8	11
Nuclear (percent)	2	9	6	4	7
Other (percent)	90	83	87	88	82

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	15.84	16.38
Sulfur Content (percent by weight) .....	.70	.66
Ash Content (percent by weight)	15.16	13.69
Pounds of Sulfur per million Btu .....	.88	.81
Dollars per million Btu	1.40	1.37
Dollars per short ton	22.12	22.48

Washington

Estimated Total State Energy Consumption, 1991: 1,965 trillion Btu (coal, 89; natural gas, 178; petroleum, 776; nuclear electric power, 45; hydroelectric power, 908; other, 3; net interstate flow of electricity and associated losses, -34).

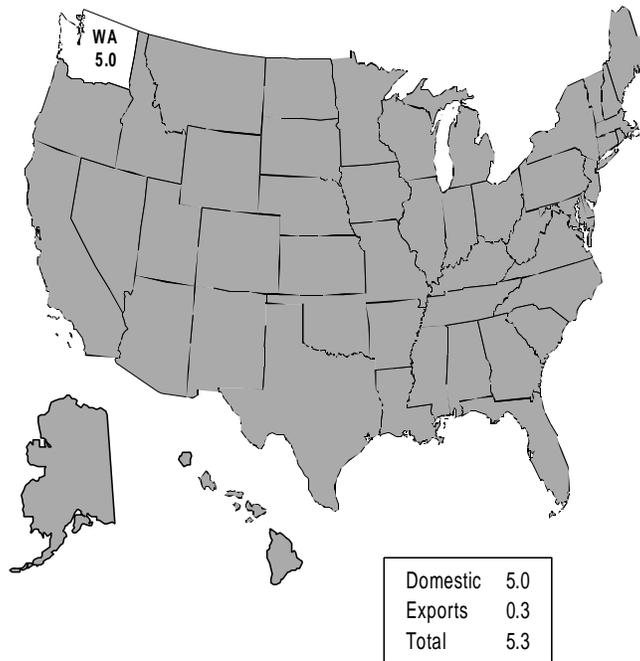
¹Includes one mine operating in two counties and counted as two mines.

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—*U.S. Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

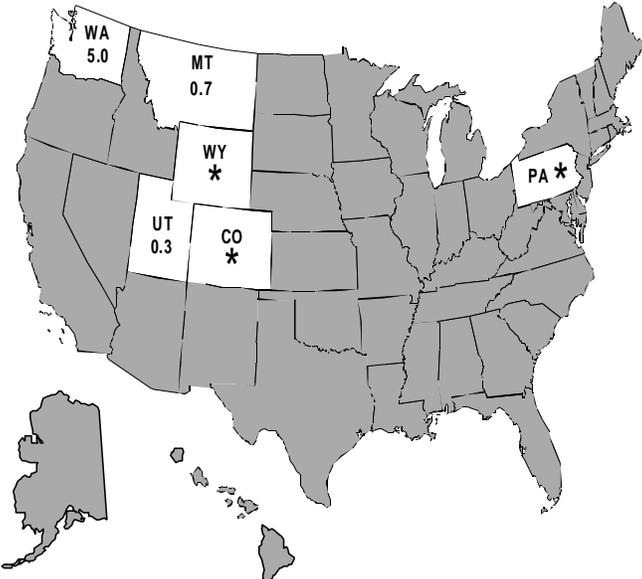
Destination of Coal Produced in Washington, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, < 1; truck, < 1; tramway/conveyor, 98.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Washington, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	6.0
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: West Virginia

West Virginia's bituminous coal resources are an important energy source for the Nation. More than 10 billion short tons have been produced since mining began in the early 1800's. In 1992, West Virginia was the second-leading coal producer after Wyoming. West Virginia's coal output dominated the States' mineral economy, accounting for about 86 percent of the estimated total value of all mineral commodities produced in the State.

Bituminous coal underlies more than two-thirds of West Virginia. The coal deposits are divided by a geological "hinge line" into the Northern and Southern fields. Coalbeds in the Northern Field generally occur in a regular sequence over a wide area, whereas those in the Southern Field vary more in thickness, and generally have a higher heating value and a lower sulfur content. The average thickness of the beds mined ranges from 3 to 7 feet.

About 20 coalbeds were mined in 1992 in the Northern Field, where the Pittsburgh and Upper Freeport were the leading sources of production. Foremost among the more than 40 coalbeds mined in the Southern Field were the Coalburg, Stockton-Lewis and Lower Kittanning. Most of West Virginia's coal can be converted into coke. The preeminent coking coal is the Pocahontas No. 3, mined in the Southern Field.

The industrial use of coal in the State became significant in the early 1800's when it replaced wood as source of heat for the salt industry in Kanawha Valley. Around the mid-1800's, illuminating oil and lubricants were produced from cannel coal (a variety of bituminous coal) in Kanawha and Elk valleys. Coke production in the State began in the late 1800's.

With railroad and river transportation facilities established in the late 1800's, the State's coal output rose rapidly from 23 million short tons in 1900 to 146 million short tons in 1927. This was followed by a drop during the Depression and then by a period of recovery. Production exceeded 150 million short tons during World War II and reached an all-time high of 176 million short tons in 1947,

when large amounts of coal were shipped to Europe during the postwar recovery period. Subsequently, production fluctuated, reflecting the increased use of diesel locomotives and other competition from petroleum, lower demand for coking coal, changes in foreign demand for West Virginia coal, new requirements in mining and environmental laws, and coal miners' strikes. Production fell below 100 million short tons in the late 1970's before resuming an upward trend. About 162 million short tons were produced in 1992.

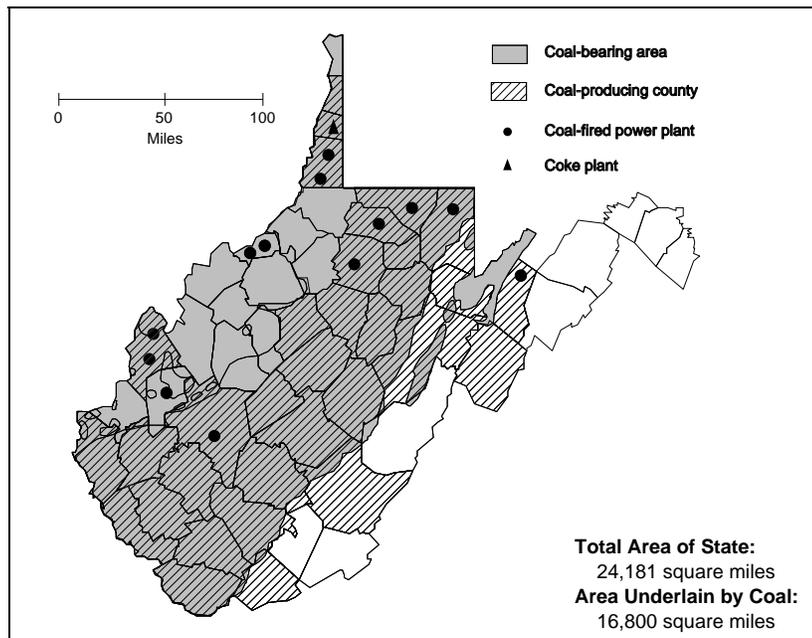
Underground mining has long been the dominant method of producing coal in West Virginia. Surface mining in the State became important in the 1940's. In 1992, the State's largest mine, with an output of over 4 million short tons, was the Federal No.2 underground mine of Eastern Associated Coal Corp., in Monongalia County. Because of relatively easy access to coalbeds on the sides of valleys, the State has many small mines, but their share of total production is relatively small. Mingo and Boone Counties were the leading coal-producing counties. Although West Virginia had the largest coal mining labor force in 1992, it ranked second to Kentucky in number of coal mines.

Most of the coal produced is shipped outside the State. Of the coal distributed in 1992, a little more than half was delivered to other States, nearly one-third was exported, and the rest remained in West Virginia. Of the coal shipped to other States, two-thirds was utility coal, delivered chiefly to Ohio and Pennsylvania. The balance was coking coal and coal for other industrial use. West Virginia was the Nation's leading source of coking coal for domestic markets and the major coal exporter. More than three-fourths of West Virginia's coal exports was estimated to be coking coal.

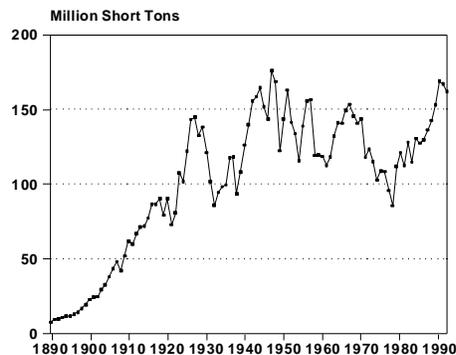
Coal consumption in West Virginia in 1992 totaled 32 million short tons, the bulk of it used to generate electricity. The electric utility industry has been the State's principal coal consumer since the late 1960's, with the increased use of utility coal offsetting losses in other sectors. Most of the utility coal is from West Virginia. The leading coal-burning generating facility is the 2,900-

megawatt John E. Amos plant of Appalachian Power Company, in Putnam County. West Virginia mines supplied about half of the coking coal used in the State; the rest was mostly from Virginia. West Virginia coal also accounted for nearly all of the coal used by other industrial consumers, chiefly chemical and metal manufacturers.

West Virginia



Coal Production, Virginia, 1890-1992



First Year of Documented Coal Production 1863 (444,648 short tons)
Peak Year of Coal Production 1947 (176,157,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	32,049	4,738	36,787
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	5,708	1,647	7,355
0.61-1.67 (medium sulfur)	5,880	1,052	6,931
> 1.67 (high sulfur)	5,517	293	5,810
Total	17,105	2,992	20,097
Estimated Recoverable Reserves at Active Mines, Year-End 1992	1,643	400	2,043

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	96,409	103,753	123,306	119,821	115,212
Mines	539	502	491	434	403
Miners	45,904	31,106	23,584	22,512	20,738
Productivity (short tons per miner per hour)	1.13	1.85	2.70	2.83	2.99
Average Mine Price (dollars per short ton)	36.46	34.31	29.75	29.63	29.14
Surface					
Quantity (thousand short tons)	25,175	24,011	45,898	47,530	46,952
Mines	223	295	280	231	201
Miners	7,499	5,552	5,994	5,798	5,279
Productivity (short tons per miner per hour)	1.67	2.54	4.02	4.18	4.27
Average Mine Price (dollars per short ton)	28.72	29.78	25.55	26.08	25.72

Total

West Virginia

Quantity (thousand short tons)	121,584	127,764	169,205	167,352	162,164
Mines	762	797	771	665	604
Miners	53,403	36,658	29,578	28,310	26,017
Productivity (short tons per miner per hour)	1.21	1.95	2.96	3.11	3.27
Average Mine Price (dollars per short ton)	34.88	33.47	28.62	28.62	28.15

West Virginia

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	28	48	23	13	152	31	200	8
Surface	13	50	13	22	38	21	137	7
All Mines	41	49	36	16	190	28	337	7

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	28,499	31,367	29,873	27,557	28,050
Coke Plants	W	W	W	W	W
Other Industrial	2,223	2,086	2,918	2,310	2,266
Residential and Commercial	W	W	W	W	W
Total	34,673	34,907	34,896	31,843	32,019
Year-End Utility Stocks					
(thousand short tons)	7,903	5,453	6,874	7,707	7,863
Electricity Generation					
Total (million kilowatthours)	70,798	79,536	77,364	71,254	72,334
Coal (percent)	99	99	99	99	99
Nuclear (percent)	0	0	0	0	0
Other (percent)	1	1	1	1	1

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	25.04	25.05
Sulfur Content (percent by weight)	1.60	2.05
Ash Content (percent by weight)	10.57	11.32
Pounds of Sulfur per million Btu	1.28	1.64
Dollars per million Btu	1.57	1.47
Dollars per short ton	39.33	36.88

West Virginia

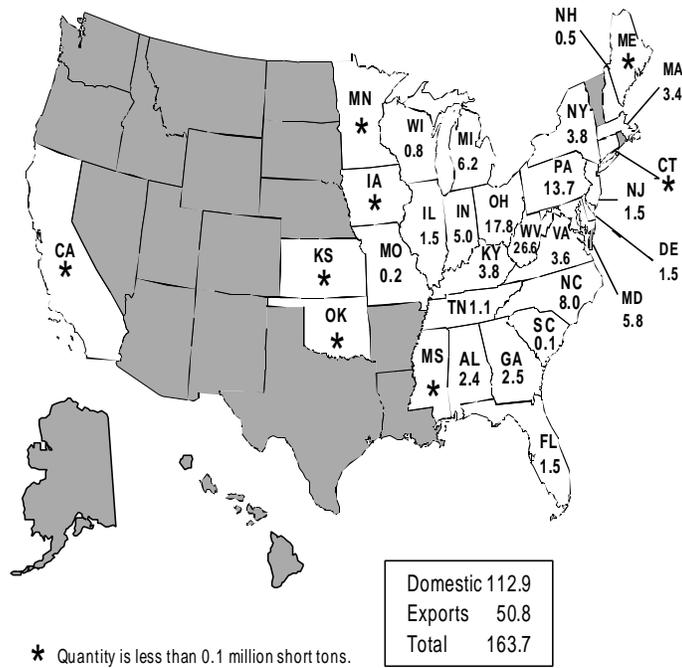
Estimated Total State Energy Consumption, 1991: 783 trillion Btu (coal, 800; natural gas, 119; petroleum, 293; nuclear electric power, 0; hydroelectric power, 11; other, 0; net interstate flow of electricity and associated losses, -439).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in West Virginia, 1992
(Million Short Tons)



Transportation modes, domestic markets (percent): rail, 53; water, 36; truck, 5; tramway/conveyor, 5; unknown, 2.

Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in West Virginia, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	32.9
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

State Coal Profile: Wyoming

Wyoming has been the Nation's leading coal producer since 1988 and the fastest growing coal-producing State over the past two decades. The dramatic rise in the State's coal output reflects the steadily increasing demand for its low-sulfur coal. Vast amounts of this coal underlie sparsely populated areas in thick, flat-lying beds that can be mined by large-scale surface methods.

nearly 10 million short tons in 1945. Coal output then trended downward, falling

Coal is Wyoming's second most valuable commodity after crude oil. The value of coal output in 1992 was estimated to account for more than one-fourth of the value of all mineral production in the State. Federal coal leases generated \$145 million in royalties that were disbursed to the State and the Federal Government.

Coal occurs in Wyoming in 10 major coal-bearing regions that underlie about half of the State. Most of these are geologic depressions with relatively flat-lying beds. Although coal rank ranges from lignite to bituminous, subbituminous coal predominates. The Powder River Basin is the center of the State's coal industry. Production is chiefly from the Wyodak coalbed, which accounts for more than 80 percent of the State's total. The Wyodak, the thickest U.S. coalbed, averages about 70 feet in thickness and exceeds 100 feet in places. It has been the Nation's leading source of coal for about a decade. Virtually all of the coal produced is used to generate electricity. Some high-quality Wyoming bituminous coal from other areas can be converted into metallurgical coke; a very small amount was produced in 1992.

Commercial mining began in Wyoming in 1867 along the Union Pacific Railroad's route in the southern part of the State. Extensive coal deposits provided fuel for locomotives on the transcontinental railroad, completed in 1869. Conversely, coal-hauling was a major source of revenue for the railroad. Other early industrial coal consumers in Wyoming included coke plants and a coal-gas plant. Coal was also shipped to other States.

Wyoming's annual coal output rose to more than 9 million short tons during World War I, but then declined due to competition from oil discovered in the State and the economic depression. World War II spurred production to

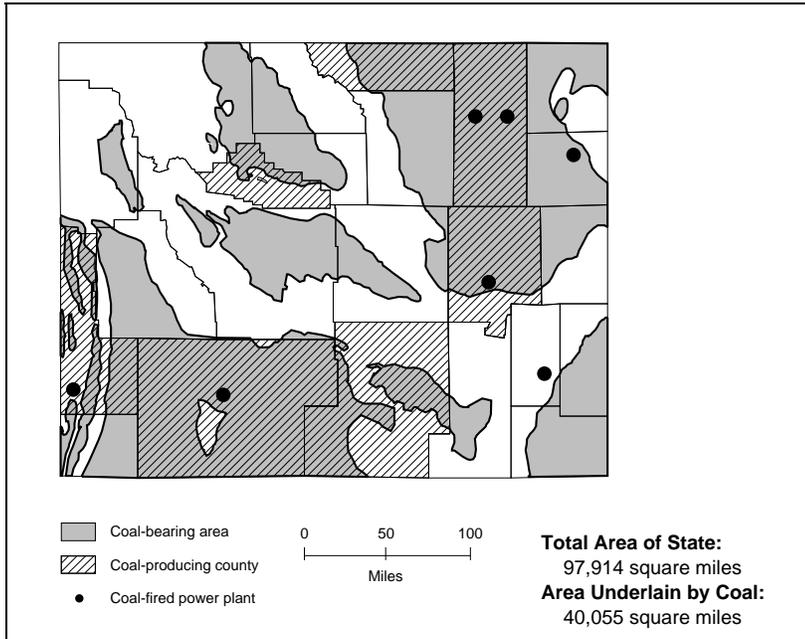
below 2 million short tons in 1958, the lowest point since 1889. Many mines along the railroad closed as diesel-electric locomotives replaced coal-fired steam locomotives.

Wyoming's coal industry remained depressed until the early 1970's, when electric utilities turned to the State's low-sulfur coal to meet new air-quality standards. Further interest in Wyoming coal was stimulated when the Arab oil embargo of 1973 brought sharp rises in oil prices and made coal the most economical fuel for power plants. The State's thick beds of low-sulfur coal provided a base for a vigorous new coal industry. As large surface mines were opened, the railroads upgraded existing lines and laid new track to support the heavy traffic of unit coal trains. The resulting coal-mining boom drove production to record-breaking levels. From 95 million short tons in 1980, coal production doubled to more than 190 million short tons in 1991 and 1992.

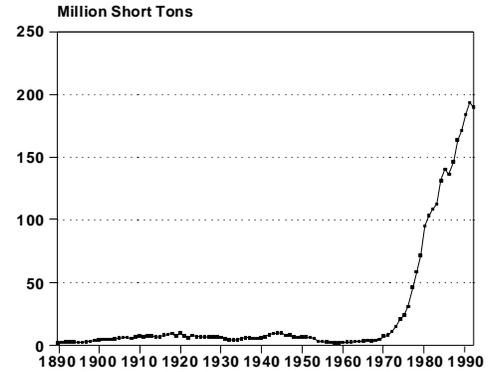
Although underground mines produced most of Wyoming's coal before World War II, surface mines now predominate. Wyoming is notable for its many large surface mines in Campbell County in the Powder River Basin. In 1992, the State claimed 7 of the 10 largest U.S. coal mines. Ranking first was the exceptionally large Black Thunder mine of Thunder Basin Coal Company (a subsidiary of ARCO Coal Company), which produced about 29 million short tons. Also in Wyoming is the largest and deepest U.S. open-pit coal mine (1 mile long and over 900 feet deep), the Kemmerer mine of Pittsburg & Midway Coal Mining Company in Lincoln County. More than 90 percent of Wyoming coal production in 1992 was from Federal leases.

Most of Wyoming's coal is shipped to utilities out of State, and a small amount is exported. Virtually all of the 27 million short tons of coal consumed in Wyoming in 1992 was utility coal produced in the State. Wyoming's largest coal-burning utility is the 2,080-megawatt Jim Bridger plant of PacifiCorp, in Sweetwater County. A small amount of coal was consumed in manufacturing such products as sodium carbonate (soda ash) from trona, bentonite, cement, and in processing sugar beets. Some coal was also converted into chemical (synthetic) coke and used for processing phosphate rock in Idaho.

Wyoming



Coal Production, 1890-1992



First Year of Documented Coal Production 1865 (800 short tons)
Peak Year of Coal Production 1991 (193,854,000 short tons)

Coal Reserves (Million Short Tons)

Type of Reserve	Underground	Surface	Total
Demonstrated Reserve Base: (January 1, 1992)	42,540	26,758	69,298
Estimated Recoverable Reserves: (January 1, 1992)			
Sulfur Content (pounds per million Btu)			
< 0.61 (low sulfur)	11,119	13,714	24,833
0.61-1.67 (medium sulfur)	11,179	6,635	17,814
> 1.67 (high sulfur)	674	2,776	3,449
Total	22,972	23,125	46,096
Estimated Recoverable Reserves at Active Mines, Year-End 1992	W	W	6,751

Production

Salient Data by Mine Type	1980	1985	1990	1991	1992
Underground					
Quantity (thousand short tons)	1,633	1,058	1,722	2,418	2,511
Mines	3	1	4	4	4
Miners	465	270	255	258	268
Productivity (short tons per miner per hour)	1.02	1.90	2.80	4.17	4.19
Average Mine Price (dollars per short ton)	W	W	W	W	W
Surface					
Quantity (thousand short tons)	93,254	139,656	182,527	191,437	187,661
Mines	22	29	29	27	26
Miners	4,334	4,174	3,075	3,043	3,058
Productivity (short tons per miner per hour)	9.75	15.09	22.84	23.11	22.76
Average Mine Price (dollars per short ton)	W	W	W	W	W

Total

Wyoming

Quantity (thousand short tons)	94,887	140,714	184,249	193,854	190,172
Mines	25	30	33	31	30
Miners	4,779	4,444	3,330	3,301	3,326
Productivity (short tons per miner per hour)	8.99	14.34	21.41	21.87	21.50
Average Mine Price (dollars per short ton)	10.54	11.36	8.43	8.09	8.14

Wyoming

Number of Mines by Production Range and Percent of Production, 1992

Mine Type	Production Range (thousand short tons)							
	1,000 and over		500 to 999		100 to 499		< 100	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Underground	<1	75	0	0	2	25	1	<1
Surface	19	99	1	<1	1	<1	5	<1
All Mines	20	99	1	<1	3	<1	6	<1

Coal Demand

Disposition	1980	1985	1990	1991	1992
Consumption (thousand short tons)					
Electric Utilities	13,499	21,173	23,526	23,115	25,114
Coke Plants	0	0	0	0	0
Other Industrial	W	W	1,857	1,896	1,861
Residential and Commercial	W	W	130	138	99
Total	15,209	23,155	25,514	25,150	27,074
Year-End Utility Stocks					
(thousand short tons)	1,813	4,022	3,215	2,767	2,153
Electricity Generation					
Total (million kilowatthours)	22,351	35,661	39,378	38,667	41,852
Coal (percent)	95	97	98	98	98
Nuclear (percent)	0	0	0	0	0
Other (percent)	5	3	2	2	2

Utility Coal Data, 1992

Average Quality and Average Delivered Cost	Produced in State	Receipts, All Sources
Heat Content (million Btu per short ton)	17.36	17.68
Sulfur Content (percent by weight) .....	.38	.52
Ash Content (percent by weight)	5.48	7.54
Pounds of Sulfur per million Btu .....	.44	.59
Dollars per million Btu	1.27	.76
Dollars per short ton	22.10	13.42

Wyoming

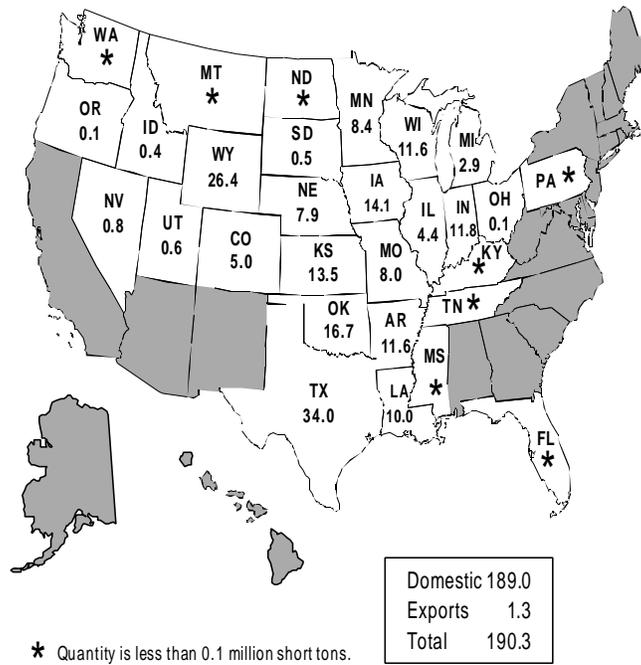
Estimated Total State Energy Consumption, 1991: 391 trillion Btu (coal, 450; natural gas, 103; petroleum, 116; nuclear electric power, 0; hydroelectric power, 8; other, 0; net interstate flow of electricity and associated losses, -286).

W = Withheld to avoid disclosure of individual company data.

Notes: **Totals may not equal sum of components because of independent rounding.** **Data coverage—Production:** all mines. **Number of mines:** 1980, mines that produced 10,000 short tons or more; other years, all mines. **Number of miners and productivity:** mines that produced 10,000 or more short tons and preparation plants that had 5,000 or more employee hours. **Average mine price:** mines that produced 10,000 or more short tons. **Average quality and average delivered cost of utility coal:** power plants with a generator nameplate capacity of 50 megawatts or more. Extent of coal-bearing areas and locations of coal-consuming plants shown on map are approximate; small coal deposits are not shown. Coal-producing counties shown on map exclude any county where all 1992 output was from mines producing less than 10,000 short tons.

Sources: Energy Information Administration—U.S. *Coal Reserves: An Update by Heat and Sulfur Content*, February 1993; *Coal Production 1992* and prior issues; *Coal Data: A Reference*; *Quarterly Coal Report October-December 1992* and prior issues; *Electric Power Annual 1991* and prior issues; *Electric Power Monthly*, March 1993; *Cost and Quality of Fuels for Electric Power Plants 1992*; *Inventory of Power Plants in the United States 1992*; *State Energy Data Report 1991: Consumption Estimates*; Map of coal-bearing areas is based mainly on U.S. Geological Survey map, *Coalfields of the United States, 1960*. Data for historical graph 1890-1975, U.S. Department of the Interior, Geological Survey and Bureau of Mines (*Minerals Yearbook* and annual predecessor *Mineral Resources of the United States*); 1976 forward, Energy Information Administration, *Coal Production 1992* and prior issues.

Destination of Coal Produced in Wyoming, 1992
(Million Short Tons)

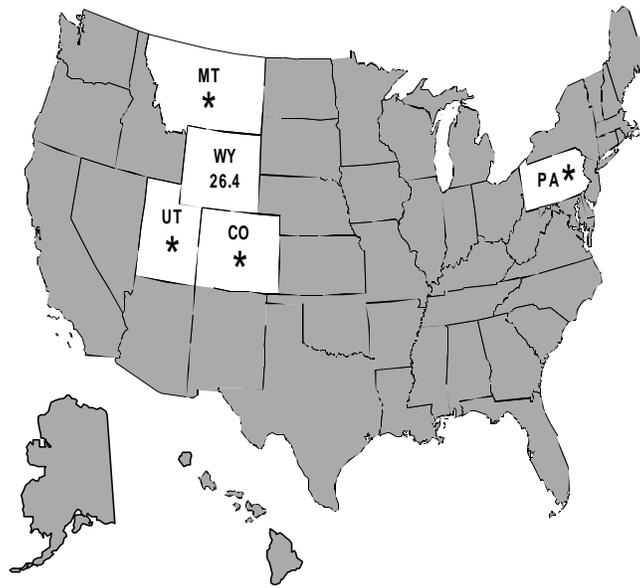


Transportation modes, domestic markets (percent): rail, 86; water, 7; truck, 2; tramway/conveyor, 5; unknown, < 1.

Note: Total may not equal sum of components because of independent rounding.

Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

Origin of Coal Received in Wyoming, 1992
(Million Short Tons)



* Quantity is less than 0.1 million short tons.

Total	26.5
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Note: Total may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-6, "Coal Distribution Report."

United States

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Appendix A

**National Rankings of
Coal Producing States
and Percent of U.S.
Total, 1992**

National Rankings of Coal-Producing States and Percent of U.S. Total, 1992

State	Demonstrated Reserve Base ^a	Estimated Recoverable Reserves ^a	Production			Number of Mines	Number of Miners	Average Productivity	Coal Consumption ^b	Coal-Fired Electricity Generation ^c	Coal Exports								
			Quantity	Value	Estimated Energy Content														
	%	%	%	%	%	%	%	%	%	%									
Alabama	15	1.0	14	1.2	12	2.6	7	5.0	11	2.9	6	3.2	6	4.9	21	9	3.5	9	3.9
.....	5	5.9																	
Alaska	12	1.3	15	1.0	23	< 1	23	< 1	23	< 1	20 ^d	< 1	22	< 1	7	46	< 1	44	< 1
.....	9	< 1																	
Arizona	26	< 1	26	< 1	16	1.3	15	1.2	16	1.3	20 ^d	< 1	14	< 1	9	19	2.0	16	2.2
.....	--																		
Arkansas	25	< 1	25	< 1	27	< 1	26	< 1	26	< 1	17	< 1	26	< 1	26	29	1.4	30	1.3
.....	17	< 1																	
California	.....	^e --	^e --		26	< 1	27	< 1	27	< 1	21	< 1	27	< 1	5	38	< 1	0	0
.....	--																		
Colorado	8	3.6	9	3.8	15	1.9	13	2.0	14	1.9	12	< 1	13	1.5	11	22	1.9	19	1.9
.....	10	< 1																	
Illinois	2	16.4	3	11.4	5	6.0	4	7.9	5	6.3	9	1.6	5	7.6	14	7	3.6	13	3.2
.....	8	1.2																	
Indiana	10	2.1	11	1.7	10	3.1	9	3.4	10	3.2	7	1.9	8	3.3	13	2	6.6	4	6.1
.....	13	< 1																	
Iowa	18	< 1	18	< 1	25	< 1	25	< 1	25	< 1	20 ^d	< 1	23	< 1	27	18	2.0	24	1.6
.....	--																		
Kansas	21	< 1	21	< 1	24	< 1	24	< 1	24	< 1	20 ^d	< 1	24	< 1	23	25	1.6	29	1.4
.....	--																		
Kentucky	6	6.1	5	5.4	3	16.1	2	18.8	2	18.4	1	27.4	2	22.3	16	5	3.9	5	4.7
.....	3	13.8																	
Louisiana	24	< 1	24	< 1	20	< 1	21	< 1	21	< 1	20 ^d	< 1	25	< 1	4	26	1.5	31	1.3
.....	--																		
Maryland	23	< 1	23	< 1	19	< 1	20	< 1	18	< 1	11	< 1	19	< 1	19	32	1.1	26	1.5
.....	12	< 1																	
Missouri	14	1.3	12	1.5	21	< 1	18	< 1	20	< 1	18	< 1	21	< 1	17	14	2.8	14	3.0
.....	--																		
Montana	1	25.2	1	28.5	8	3.9	14	1.9	8	3.2	15 ^d	< 1	17	< 1	2	31	1.2	32	1.1
.....	14	< 1																	
New Mexico	16	< 1	16	< 1	13	2.6	11	2.7	13	2.1	16	< 1	12	1.5	8	24	1.7	22	1.6
.....	16	< 1																	
North Dakota	11	2.0	10	2.8	9	3.2	16	1.1	15	1.9	15 ^d	< 1	16	< 1	3	10	3.4	21	1.7
.....	--																		
Ohio	7	5.0	7	4.5	11	3.0	8	3.9	7	3.4	5	5.4	7	4.1	18	3	6.6	1	7.7
.....	18 ^d	< 1																	
Oklahoma	19	< 1	19	< 1	22	< 1	22	< 1	22	< 1	13	< 1	20	< 1	25	20	2.0	20	1.8
.....	15	< 1																	

Energy Information Administration/ State Coal Profiles

Appendix B

**State Agencies and
Other Organizations
Concerned with Coal
and Energy**

Appendix B

State Agencies and Other Organizations Concerned with Coal and Energy

ALABAMA

Alabama Coal Association, Vestavia Commerce Centre, 2090 Columbiana Road, Suite 2500, Birmingham, AL 35216; (205) 822-0384.

Alabama Department of Conservation and Natural Resources, State Lands Division, 64 North Union St., Montgomery, AL 36130-1901; (205) 242-3484.

Alabama Department of Economic and Community Affairs, Division of Science, Technology and Energy, P.O. Box 5690, Montgomery, AL 36103-5690; (205) 242-5100.

Alabama Department of Industrial Relations, Abandoned Mines Reclamation Commission, 11 West Oxmore, Suite 100, Birmingham, AL 35209; (205) 945-8671.

Alabama Department of Industrial Relations, Division of Safety and Inspection, P.O. Box 10444, Birmingham, AL 35202; (205) 254-1275.

Alabama Development Office, Alabama Center for Commerce, 401 Adams Avenue, Montgomery, AL 36130; (205) 242-0400.

Alabama Energy Office, Department of Economics and Community Affairs, Science Technology and Energy Division, P. O. Box 5690, Montgomery, AL 36103-5690; (205) 223-7008.

Alabama Surface Mining Commission, P.O. Box 2390, Jasper, AL 35502-2390; (205) 221-4130.

Coalbed Methane Association of Alabama, 1855 Data Drive, Suite 160, Birmingham, AL 35244; (205) 733-8087.

Geological Survey of Alabama, 420 Hackberry Lane, Box O, Tuscaloosa, AL 35486-9780; (205) 349-2852.

The University of Alabama, Mineral Resources Institute, Box 870204, Tuscaloosa, AL 35487-0204; (205) 348-2044.

The University of Alabama, School of Mines and Energy Development, Box 870164, Tuscaloosa, AL 35487-0164; (205) 348-4520.

ALASKA

Alaska Coal Association, 122 First Ave., Suite 302, Fairbanks, AK 99701; (907) 452-2625.

Alaska Department of Commerce and Economic Development, Division of Energy and Power Development, State Office Building, P.O. Box 110804, Juneau, AK 99811-0804; (907) 465-2017.

Alaska Department of Environmental Conservation, 410 Willoughby Avenue, Suite 105, Juneau, AK 99811-1795; (907) 465-5280.

Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, 794 University Avenue, Suite 200, Fairbanks, AK 99709-3645; (907) 474-7147.

Alaska Department of Natural Resources, Division of Mining, Box 107016, Anchorage, AK 99510-7016; (907) 762-2165.

Alaska Energy Office, Rural Development Division, Energy Programs, 333 W. 4th Avenue, Suite 220, Anchorage, AK 99501-2341; (907) 269-4500.

Alaska Miners Association, 501 W. Northern Lights Blvd., Suite 203, Anchorage, AK 99503-2565; (907) 276-0347.

Coal Operators and Alaska Leaseholders, P. O. Box 1000, Healy, AK 99743; (907) 683-2226.

ARIZONA

Arizona Department of Environmental Quality, 1502 West Washington, Phoenix, AZ 85007; (602) 257-2300.

Arizona Department of Mines and Resources, Mineral Building, State Fairgrounds, 1502 West Washington, Phoenix, AZ 85007; (602) 255-3791.

Arizona Energy Office of the Department of Commerce, 3800 North Central Avenue, Suite 1200, Phoenix, AZ 85012; (602) 280-1402.

Arizona Geological Survey, 845 North Park Avenue, Suite 100, Tucson, AZ 85719; (602) 882-4795.

Arizona State Land Department, 1616 West Adams, Phoenix, AZ 85007; (602) 542-4628.

Arizona State Mine Inspector, 1700 West Washington, Suite 400, Phoenix, AZ 85007; (602) 542-5971.

Salt River Project, P.O. Box 52025, Phoenix, AZ 85072-2025; (602) 236-5900.

ARKANSAS

Arkansas Department of Labor, State Mine Inspection Division, 616 Garrison, Suite 205, Forth Smith, AR 72901; (501) 783-2103.

Arkansas Department of Pollution Control and Ecology, Mining Division, 8001 National Drive, Little Rock, AR 72209; (501) 562-7444.

Arkansas Energy Office, No. 1 State Capitol Mall, Suite 4B215, Little Rock, AR 72201; (501) 682-7315.

Arkansas Geological Commission, 3815 West Roosevelt Road, Little Rock, AR 72204; (501) 663-9714.

CALIFORNIA

California Department of Conservation, State Mining and Geology Board, 801 K Street, MS09-05, Sacramento, CA 95814; (916) 322-1082.

California Division of Mines and Geology, 801 K Street, MS12-30, Sacramento, CA 95814; (916) 445-1923.

California Energy Commission, 1516 9th St., Sacramento, CA 95814; (916) 654-4287.

California Occupational Safety and Health, Mining and Tunneling, 1209 Woodrow Ave., Suite C4, Modesto, CA 95350; (209) 576-6241.

COLORADO

Colorado Department of Natural Resources, Colorado Geological Survey, 1313 Sherman Street, Rm. 715, Denver, CO; 80203-2273; (303) 866-2611.

Colorado Department of Natural Resources, Division of Minerals and Geology, 1313 Sherman St., Rm. 215, Denver, CO 80203-2273; (303) 866-3401.

Colorado Department of Natural Resources, Office of Active and Inactive Mines, 1313 Sherman Street, Rm. 215, Denver, CO 80203-2273; (303) 826-3567.

Colorado Mining Association, 1340 Colorado State Bank Building, 1600 Broadway, Denver, CO 80202; (303) 894-0536.

Colorado Office of Energy Conservation, 1675 Broadway, Suite 1300, Denver, CO 80202-4613; (303) 620-4292.

Energy Minerals Field Institute, Colorado School of Mines, EMFI Department, Golden, CO 80401; (303) 273-3900.

Northwest Colorado Energy Producers, P.O. Box 68, Craig, CO 81626; (303) 824-8246.

Rocky Mountain Coal Mining Institute, 3000 Youngfield St., Suite 324, Lakewood, CO 80215; (303) 238-9099.

Western Coal Transportation Association, 5555 DTC Parkway, Greenwood Village, CO 80111; (303) 694-6611.

ILLINOIS

Coal Producers Association of Illinois, 401-3 Harrisburg National Bank Building, Harrisburg, IL 62946; (618) 252-8321.

Illinois Coal Association, 212 South Second St., Springfield, IL 62701; (217) 528-2092.

Illinois Department of Energy and Natural Resources, Office of Coal Development and Marketing, 325 West Adams St., Rm. 300, Springfield, IL 62704; (217) 785-2800.

Illinois Department of Energy and Natural Resources, State Geological Survey, Natural Resources Building, 615 East Peabody Drive, Champaign, IL 61820; (217) 333-5111.

Illinois Department of Mines and Minerals, 300 West Jefferson St., Suite 300, Springfield, IL 62719-0137; (618) 439-9111.

Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, IL 62706; (217) 782-3397.

Progressive Mine Workers of America, Rt. 34, P.O. Box 640, Harrisburg, IL 62946; (618) 252-5321.

INDIANA

Indiana Bureau of Mines and Mining, 6 Northeast 21st St., Washington, IN 47501; (812) 254-1040.

Indiana Coal Association, 5349 Washington Blvd., Indianapolis, IN 46220; (317) 257-1993.

Indiana Coal Council, Inc., 143 W. Market St., Indianapolis, IN 46204; (317) 638-6997.

Indiana Department of Commerce, Office of Energy Policy Division, 1 North Capitol, Indianapolis, IN 46204-2288; (317) 232-8940.

Indiana Department of Environmental Management, 100 North Centate, P.O. Box 6015, Indianapolis, IN 46206-6015; (317) 232-8162.

Indiana Department of Natural Resources, Division of Reclamation, 402 West Washington St., W2-95, Indianapolis, IN 46204; (317) 232-1547.

Indiana Geological Survey, 611 North Walnut Grove Avenue, Bloomington, IN 47405; (812) 855-9350.

IOWA

Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation, Wallace State Office Building, Des Moines, IA 50319; (515) 281-6147.

Iowa Department of Natural Resources, Energy and Geological Resources Division, Geological Survey Bureau, 109 Trowbridge Hall, Iowa City, IA 52242; (319) 335-1575.

Iowa Department of Natural Resources, Energy and Geological Resources Division, Wallace State Office Building, Des Moines, IA 50319; (515) 281-6682.

Iowa State University, Iowa State Mining and Mineral Resources Research Institute, 280 Metals Development Building, Ames, IA 50011; (515) 294-3758.

KANSAS

Kansas Corporation Commission, Energy Division, 1500 S.W. Arrowhead Road, Topeka, KS 66604; (913) 271-3170.

Kansas Department of Health and Environment, Mining Section, Box 1418, Pittsburg, KS 66762; (316) 231-8540.

Kansas Geological Survey, 1930 Constant Avenue, The University of Kansas, Lawrence, KS 66047; (913) 864-3965.

Technology Enterprise Corporation of Kansas, 112 West 6th Street, Suite 400, Topeka, KS 66603; (913) 296-5272.

KENTUCKY

Governor's Office for Coal and Energy Policy, 3572 Iron Works Pike, Box 11888, Lexington, KY 40578-1916; (606) 252-5535.

Harlan County Coal Operators Association, P.O. Box 230, Harlan, KY 40831; (606) 573-2656.

Institute for Mining and Minerals Research, 233 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107; (606) 257-8636.

Kentucky Coal Association, 340 South Broadway, Lexington, KY 40508; (606) 233-4743.

Kentucky Coal Marketing and Export Council, Division of Energy, 2100 Capital Plaza Tower, 500 Mero Street, Frankfort, KY 40601; (502) 564-7140.

Kentucky Coal Operators & Associates, Inc., 642 North Mayo Trail, P.O. Box 3158, Pikeville, KY 41502; (606) 432-2161.

Kentucky Department of Mines and Minerals, 3572 Iron Works Pike, Box 14080, Lexington, KY 40512; (606) 254-0367.

Kentucky Department for Surface Mining Reclamation and Enforcement, 2 Hudson Hollow, Frankfort, KY 40601; (502) 564-6940.

Kentucky Environmental Protection Department, Fort Boone Plaza, 18 Reilly Rd., Frankfort, KY 40601; (502) 564-2150.

Kentucky Geological Survey, 228 Mining and Mineral Resources Building, University of Kentucky, Lexington, KY 40506-0107; (606) 257-5863.

Kentucky Natural Resources and Environmental Protection Cabinet, Energy Division, 691 Teton Trail, Frankfort, KY 40601; (502) 564-7192.

Kentucky Reclamation Association, 1850 Lantaff Blvd., Madisonville, KY 42431; (502) 821-2760.

Kentucky Small Operators Assistance Program, 2 Hudson Hollow, Frankfort, KY 40601; (502) 564-2356.

Kentucky-Tennessee Coal Operators Association, P.O. Box 281, Corbin, KY 40701; (606) 528-9481.

Western Kentucky Coal Association, P.O. Box 4148, Frankfort, KY 40604; (502) 223-1437.

LOUISIANA

Louisiana Department of Natural Resources, Energy Office, P.O. Box 94396, Baton Rouge, LA 70804-9396; (504) 342-4534.

Louisiana Department of Natural Resources, Geological Survey, Box G, University Station, Baton Rouge, LA 70893; (504) 388-5320.

Louisiana Department of Natural Resources, Office of Conservation, Injection and Mining Division, Box 94275, Capital Station, Baton Rouge, LA 70804; (504) 342-5515.

Louisiana Department of Natural Resources, Office of Mineral Resources, Geological and Engineering Division, Box 2827, Baton Rouge, LA 70821; (504) 342-4433.

MARYLAND

Maryland Bureau of Mines, 160 South Water St., Frostburg, MD 21532; (301) 689-6104.

Maryland Coal Association, 59 E. Main St., Frostburg, MD 21532; (301) 689-6609.

Maryland Energy Administration, 45 Calvert St., 4th Floor, Annapolis, MD 21401; (410) 974-3751.

Maryland Geological Survey, 2300 St. Paul St., Baltimore, MD 21218; (410) 554-5503.

MISSOURI

Mining Industry Council of Missouri, P.O. Box 725, Jefferson City, MO 65102; (314) 635-7308.

Missouri Department of Labor and Industrial Relations, Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102; (314) 751-3403.

Missouri Department of Natural Resources, Division of Energy, P.O. Box 176, Jefferson City, MO 65012; (314) 751-4000.

Missouri Department of Natural Resources, Division of Geology and Land Survey, 111 Fairgrounds Road, P.O. Box 250, Rolla, MO 65401; (314) 368-2100.

Missouri Department of Natural Resources, Land Reclamation Commission, 111 Fairgrounds Road, P.O. Box 250, Rolla, MO 65401; (314) 751-4041.

Missouri Land Reclamation Commission, P.O. Box 176, Jefferson City, MO 65102; (314) 751-4041.

University of Missouri--Rolla, Mining and Mineral Resources Research Institute, 104 Mining Building, Rolla, MO 65401; (314) 341-4153.

MONTANA

Montana Bureau of Mines and Geology, Montana College of Mineral Science and Technology, Butte, MT 59701; (406) 496-4180.

Montana Department of Natural Resources and Conservation, Energy Division, 1520 East Sixth Avenue, Helena, MT 59620-2301; (406) 444-6812.

Montana Department of Labor and Industry, Division of Workers Compensation, Safety Bureau, Mining Section, P.O. Box 1728, Helena, MT 59624; (406) 444-6401.

Montana Department of State Lands, Capitol Station, 1625 11th Avenue, Helena, MT 59620; (406) 444-2074.

Montana Mining Association, 2301 Colonial Drive, Helena, MT 59601; (406) 442-6223.

NEW MEXICO

New Mexico Bureau of Mines and Mineral Resources, Campus Station, Socorro, NM 87801; (505) 835-5410.

New Mexico Department of Energy, Minerals, and Natural Resources, Mining and Minerals Division, 2040 South Pacheco, Santa Fe, NM 87505; (505) 827-5970.

New Mexico Department of Energy, Minerals, and Natural Resources, Energy Conservation and Management Division, 2040 South Pacheco, Santa Fe, NM 87505; (505) 827-5900.

New Mexico Mining Association, 6020 Academy NE, Suite 201, Albuquerque, NM, 87109; (505) 857-0377.

NORTH DAKOTA

North Dakota State Land Development, Energy Impact Officer, 918 East Divide Avenue, Suite 410, P.O. Box 5523, Bismark, ND 58502-5523; (701) 224-3188.

Lignite Energy Council, 1016 E. Owens Avenue, P.O. Box 2277, Bismark, ND 58502; (701) 258-7117.

North Dakota Geological Survey, 600 East Boulevard, Bismark, ND 58505-0840; (701) 224-4109.

North Dakota Mining and Mineral Resources Research Institute, Energy and Environment Research Center, University of North Dakota, Box 9018, University Station, Grand Forks, ND 58202; (701) 777-4574.

North Dakota Office of State Tax Commissioner, Utility Tax Auditor, State Tax Department, State Capitol Building, 600 East Building Ave., Bismark, ND 58505; (701) 224-2770.

North Dakota Public Service Commission, Reclamation Division, Capitol Building, 12th Floor, Bismark, ND 58505-0480; (701) 224-2400.

OHIO

Ohio Coal Development Office, Community Development Division, Office of Energy Efficiency, 77 S. High St., Columbus, OH 43266-0413; (614) 466-6797.

Ohio Department of Industrial Relations, Mine Division, 2323 W. 5th Avenue, Box 825, Columbus, OH 43266-0567; (614) 644-2234.

Ohio Department of Natural Resources, Geological Survey Division, 4383 Fountain Square Drive, Columbus, OH 43224-1362; (614) 265-6576.

Ohio Mining & Reclamation Association, 50 S. Young St., Columbus, OH 43215; (614) 228-6336.

Ohio Valley Coal Operators Association, 209 Lew-Port Building, 100 W. Main St., St. Clairsville, OH 43950; (614) 695-2214.

OKLAHOMA

Association of Oklahoma General Contractors, 301 N.E. Expressway, P.O. Box 43152, Oklahoma City, OK 73105; (405) 843-5661.

Oklahoma Conservation Commission, 2800 North Lincoln, Suite 160, Oklahoma City, OK 73105; (405) 521-2384.

Oklahoma Department of Commerce, Division of Community Affairs and Development, 6601 Broadway Extension, Oklahoma City, OK 73116; (405) 841-9326.

Oklahoma Department of Mines, 4040 N. Lincoln, Oklahoma City, OK 73105; (405) 521-3859.

Oklahoma Geological Survey, University of Oklahoma, The Energy Center, 100 East Boyd, Room N131, Norman, OK 73019-0628; (405) 325-3031.

University of Oklahoma, Mining & Mineral Resources Research Institute, 100 East Boyd, Norman, OK 73019; (405) 325-5811.

PENNSYLVANIA

Pennsylvania Coal Association, 212 North Third St., Harrisburg, PA 17101; (717) 233-7900.

Pennsylvania Department of Environmental Resources, Bureau of Deep Mine Safety, Market Street State Office Building, 400 Market Street, P.O. Box 8463, Harrisburg, PA 17105-8463; (717) 783-7515.

Pennsylvania Department of Environmental Resources, Bureau of Mining and Reclamation, P.O. Box 8461, Executive House #209, 2nd and Chestnut St., Harrisburg, PA 17105; (717) 787-5103.

Pennsylvania Department of Environmental Resources, Bureau of Topographic and Geologic Survey, P.O. Box 8453, Evangelical Press Building, Third and Reily Streets, Harrisburg, PA 17105-8453; (717) 787-2169.

Pennsylvania Energy Development Authority, 116 Pine St., Harrisburg, PA 17101; (717) 783-9981.

Western Pennsylvania Coal Operators Association, Box 123, West Sunbury, PA 16061; (412) 637-2453.

TENNESSEE

Kentucky-Tennessee Coal Operators Association, P.O. Box 281, Corbin, KY 40701; (606) 528-9481.

State of Tennessee Department of Labor, Division of Mines, P.O. Box 124, Caryville, TN 37714; (615) 562-4914.

Tennessee Coal Association, P.O. Box 12248, Knoxville, TN 37912; (615) 688-6080.

Tennessee Department of Conservation, Division of Geology, 401 Church Street, 13th Floor, Nashville, TN 37243-0445; (615) 532-1500.

Tennessee Department of Economic and Community Development, Energy Division, 320 6th Avenue North, Nashville, TN 37219; (615) 741-2372.

Tennessee Department of Health and Environment, Division of Surface Mining, 2700 Middlebrook Pike, Knoxville, TN 37921; (615) 594-6035.

TEXAS

Bureau of Economic Geology, The University of Texas at Austin, University Station, Box X, Austin, TX 78713-7508; (512) 471-7721.

Railroad Commission of Texas, Surface Mining and Reclamation Division, Capitol Station, P.O. Box 12967, Austin, TX 78711; (512) 463-7288.

Texas Energy Office, Capitol Station, P.O. Box 13047, Austin, TX 78711; (512) 463-1931.

Texas General Land Office, Energy Resources Division, Stephen F. Austin Building, 1700 North Congress Avenue, Austin, TX 78701; (512) 463-5022.

Texas Mining & Reclamation Association, 300 Highland Mall Boulevard, Austin, TX 78752; (512) 467-1300.

UTAH

Utah Coal Operators Association, c/o Valley Camp of Utah, Inc., Scofield Route, Helper, UT 84526; (801) 448-9420.

Utah Division of Oil, Gas and Mining, 3 Triad Center, Suite 350, 355 West North Temple, Salt Lake City, UT 84180-1203; (801) 538-5340.

Utah Energy Office, 355 West North Temple, 3 Triad Center, Salt Lake City, UT 84180-1204; (801) 538-5428.

Utah Geological and Mineral Survey, 2363 South Foothill Drive, Salt Lake City, UT 84109; (801) 467-7970.

Utah Mining Association, 825 Kearns Building, Salt Lake City, UT 84101; (801) 364-1874.

VIRGINIA

National Independent Coal Operators Association, 1514 Front St., P.O. Box 354, Richlands, VA 24641; (703) 964-6065.

Virginia Center for Coal and Energy Research, Virginia Polytechnic Institute and State University, 617 Main St., Blacksburg, VA 24060-0411; 1-800-552-3831.

Virginia Coal Association, 425 Old City Hall, 1001 E. Broad St., Richmond, VA 23219; (804) 643-6697.

Virginia Coal Council, 1901 Front St., P.O. Box X, Richlands, VA 24641; (703) 964-6363.

Virginia Department of Mines, Minerals, and Energy, Division of Energy, 2201 West Broad St., Richmond, VA 23220; (804) 367-6851.

Virginia Department of Mines, Minerals, and Energy, Division of Mineral Resources, Alderman and McCormick Roads, Box 3667, Charlottesville, VA 22903; (804) 293-5121.

Virginia Department of Mines, Minerals, and Energy, Division of Mineral Mining, 7705 Timberlake Road, Box 4499, Lynchburg, VA 24502; (804) 239-0602.

Virginia Department of Mines, Minerals, and Energy, Division of Mines, 2201 West Broad St., Richmond, VA 23220; (804) 367-0330.

Virginia Department of Mines, Minerals, and Energy, Division of Mines, 219 Wood Road, Big Stone Gap, VA 24219; (703) 523-0335.

Virginia Mining & Reclamation Association, 18 Seventh St., Park Avenue Center, Suite 203, Norton, VA 24273; (703) 679-0456.

WASHINGTON

Northwest Mining Association, 414 Peyton Building, Spokane, WA 99201; (509) 624-1158.

Washington Department of Labor and Industries, Division of Industrial Safety and Health, Technical Services Division, Box 44651, Building #6, Olympia, WA 98504; (206) 956-5642.

Washington Department of Natural Resources, Division of Geology and Earth Resources, Mail Stop 47007, Olympia, WA 98504; (206) 902-1450.

Washington Department of Natural Resources, Division of Lands and Minerals, Mail Stop 47014, Olympia, WA 98504; (206) 902-1600.

Washington State Energy Office, 925 Plum, Olympia, WA 98504; (206) 956-2000.

WEST VIRGINIA

Governor's Office of Community and Industrial Development, Building 6, 553 Capitol Complex, Charleston, WV 25305; (304) 558-4010.

Tri-State Coal Operators Association, Inc., P.O. Box 259, Kingwood, WV 26537; (304)-329-0976.

West Virginia Coal Association, 1301 Laidley Tower, Charleston, WV 25301; (304) 342-4153.

West Virginia Department of Commerce, Labor and Environmental Resources, Office of Miner's Health and Safety Training, State Capitol Complex, Bldg. 1, Rm. M1-46, 1900 Kanawha Boulevard East, Charleston, WV 25305-0310; (304) 558-0400.

West Virginia Division of Natural Resources, State Capitol Complex, Building 3, 1900 Kanawha Boulevard East, Charleston, WV 25305 (304) 558-2754.

West Virginia Geological and Economic Survey, Mont Chateau Research Center, Box 879, Morgantown, WV 26507-0879; (304) 594-2331.

West Virginia Mining & Reclamation Association, 1624 Kanawha Boulevard East, Charleston, WV 25311; (304) 346-5318.

WYOMING

Geological Survey of Wyoming, P.O. Box 3008, University Station, Laramie, WY 82701; (307) 766-2286.

Wyoming Department of Commerce, Division of Economic and Community Development, Barrett Building, Cheyenne, WY 82002; (307) 777-7284.

Wyoming Department of Revenue, Mineral Tax Division, Herschler Building, 122 W. 25th St., Cheyenne, WY 82002-0110; (307) 777-7215.

Wyoming Mining Association, 1700 West Lincoln Way, Cheyenne, WY 82001; (307) 635-0331.

Wyoming State Inspector of Mines, P.O. Box 1094, Northwilde State Bank Building, Rock Springs, WY 82902; (307) 362-5222.

Glossary

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Anthracite: A hard, black, lustrous coal (sometimes called “hard coal”); the highest rank of coal in the coalification series, with a high heat value and low sulfur content; relatively small amounts are mined in northeastern Pennsylvania.

Ash: Impurities consisting of silica, iron, alumina, and other incombustible matter.

Bituminous coal: The most common coal; ranks between anthracite and subbituminous coal in the coalification series; includes coal with the highest heat value and a wide range in sulfur content; mined predominantly in Appalachia.

Btu (British thermal unit): The amount of heat needed to raise the temperature of 1 pound of water (approximately 1 pint) by 1 degree Fahrenheit; a convenient measure by which to compare the energy content of various fuels.

Coal gasification: The process of breaking down the molecular structure of coal to produce hydrogen and carbon, which can be combined to form synthetic natural gas for energy use or, if further processed, to produce chemicals. Coal gasification plants are in North Dakota, Louisiana, and Tennessee.

Coal preparation plant: A facility where coal is crushed, screened, and cleaned to remove impurities such as rock and sulfur, and to meet market specifications.

Coke: Produced from coking (metallurgical) coal, coke is hard and porous; used mainly as a fuel and reducing agent in a blast furnace to smelt iron ore for steelmaking.

Coking coal (metallurgical coal): A bituminous coal, low in ash and sulfur, that can be converted into coke when baked in an oven; in practice, several coals are blended to produce coke.

Demonstrated Reserve Base of coal: The part of the coal in the ground (coal resource) that meets certain criteria for geologic reliability and economic minability; the starting point for most coal supply analyses.

Federal coal lease: A lease granted to a mining company to produce coal from land owned and administered by the Federal Government in exchange for royalties and other revenues.

Indian coal lease: A lease granted to a mining company to produce coal from Indian lands in exchange for royalties and other revenues; obtained by direct negotiation with the Indians, but subject to approval and administration by the U.S. Department of the Interior.

Lignite: Coal that ranks below subbituminous coal in the coalification series, with the lowest heat value and a low sulfur content; generally not economical to ship long distances because of its low heat content and its potential for spontaneous combustion when stored for extended periods; produced as a fuel in Texas, North Dakota, Louisiana, and Montana, and as a source of montan wax in California.

Open-pit coal mine: A surface mine that produces from steeply inclined coalbeds.

Recoverable Reserves of coal: The part of the Demonstrated Reserve Base that can be economically recovered after allowing for environmental, legal, and technologic constraints.

Subbituminous coal: Coal that ranks between bituminous coal and lignite in the coalification series; generally has a low sulfur content and a comparatively low heat value; produced in the West and Alaska.

Sulfur: One of the elements present in varying quantities in coal that contributes to environmental degradation when coal is burned; occurs most commonly as the mineral pyrite.

Surface coal mine: A mine where the soil and rock (overburden) are removed to expose the coalbed, which is then excavated with equipment such as power shovels and front-end loaders.

Underground coal mine: A mine in which tunneling is used to reach the coalbed, which is then excavated with various types of equipment.